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GOV.-GEN. LEONARD WOOD

BREAKING THE TREATIES BY TAXATION

SHANGHAI'S ELECTRICITY DEPARTMENT

COMMUNICATIONS IN CHINA

GOLD MINING IN HEILUNGKIANG

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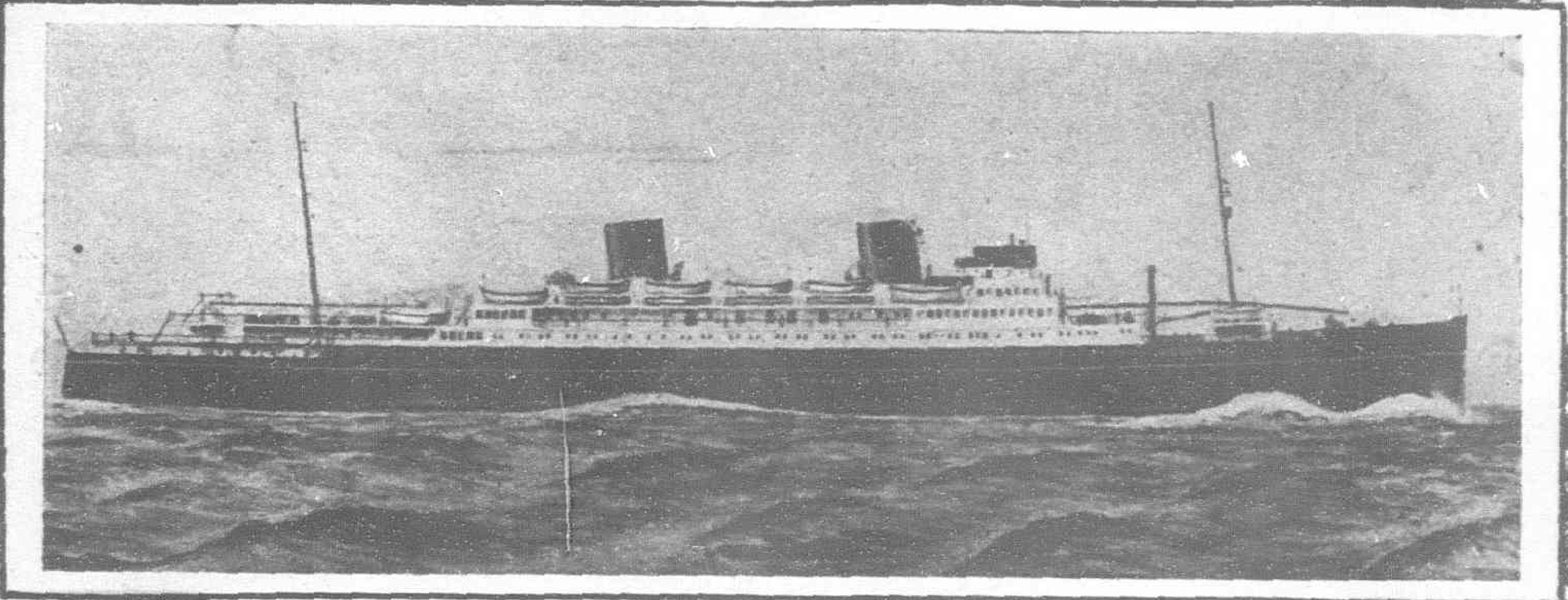

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

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Governor-General Leonard Wood

By *James Hoeck**

UNREWARDED for the greatest achievement of his career, and for perhaps the greatest service that any American has performed in the Far East, Governor-General Leonard Wood of the Philippines died in Boston following an operation on August 7.

Unrewarded, because none of the public honors that are usually bestowed upon America's public servants came to him in recognition of the work he was performing, and yet a living eulogy far more significant than any pinning of medals on the catafalque was awarded him before his sudden demise, the triumph of surmounting insuperable obstacles in the execution of his duties, a man who labored for six years in a position of "responsibility without authority," a Christian who had a high sense of America's mission in the Orient, and who held unerringly to a course despite all the allurements and discouragements which could be placed in his path, a man whose worst enemies were the apathy of the people in America to the work he was doing, the Americans in Manila, who felt that he was not harsh enough, the Filipino political leaders who considered him too harsh. He fought in a remote, small, and isolated world. The echoes of the battle rarely reached Washington and still it involved the highest principles of American statesmanship.

And the fact that he succeeded in setting the Islands back on the path to progress from which they had veered for so long was the highest tribute to his genius as a colonial administrator. What was this great work of Governor-General Wood in the Philippines ? In his own words, his ideals were expressed in an interview with Edward Price Bell which epitomizes all the soul and vitality of the man in the closing triumph of his life :

"Our presence in the Philippines is needed on both the side of the Occident and the Orient. We want to live on terms of amity and equality with all our Asiatic neighbors. We stand for the open door. We stand for a solution of every industrial, commercial and political question on a basis of reason and justice We have earned, we have paid for our right to carry our experiment in the Philippines to full fruition.

"We cannot think of this Philippine question, without thinking of civilization as a whole. And civilization to us is Christian civilization. We are a stone, if not the keystone, of the arch of Christian civilization in the Far East. America in the Philippines insures the effective deployment of Christianity. These are solemn obligations and great opportunities. We can be false to them only at the cost of treason to that faith which we believe essential to the highest human development. Let us go out of the Philippines only when we can leave the torch of that faith in strong hands. If we and those who believe as we do can Christianize the world, in the full ethical and psychic sense of that phrase, we shall rid it of injustice, of human degradation, of social cleavage and conflict, and of international slaughter. I attach great importance to developing the Philippines as Christianity's great peaceful outpost in the Pacific.

"Our task in the Philippines is to bring up the general level of education and efficiency to the point where the individual citizens of competence are sufficiently numerous to support a stable structure of government, of social relations and of industrial and commercial prosperity.

"Potentially they are capable of self-government. But to translate this potentiality into an actuality will take a long time. These people are property-loving and law-abiding. They are sympathetic, intelligent, hospitable and neighborly. Their keenness for education is unsurpassed. Political affairs receive more and more public attention and there is a growing interest in public health and public works. Assimilability to western ideals is marked.

"But all these things in the Philippines are merely tokens of what can be done—not what is—in the way of capacity for government. Before you have a government you must have a country to govern ; you must have agriculture, commerce, industry and finance. Too many educated Filipino minds are dazzled by professional and political ambition, too few attracted by the harder and more important tasks of maintaining a civilized society.

"Our earlier efforts here were well-conceived and well-executed. We were making splendid progress. Then injudicious idealism entered....There was too much surrendering of executive authority combined with too much legislative usurpation,

Gov.-Gen. Leonard Wood

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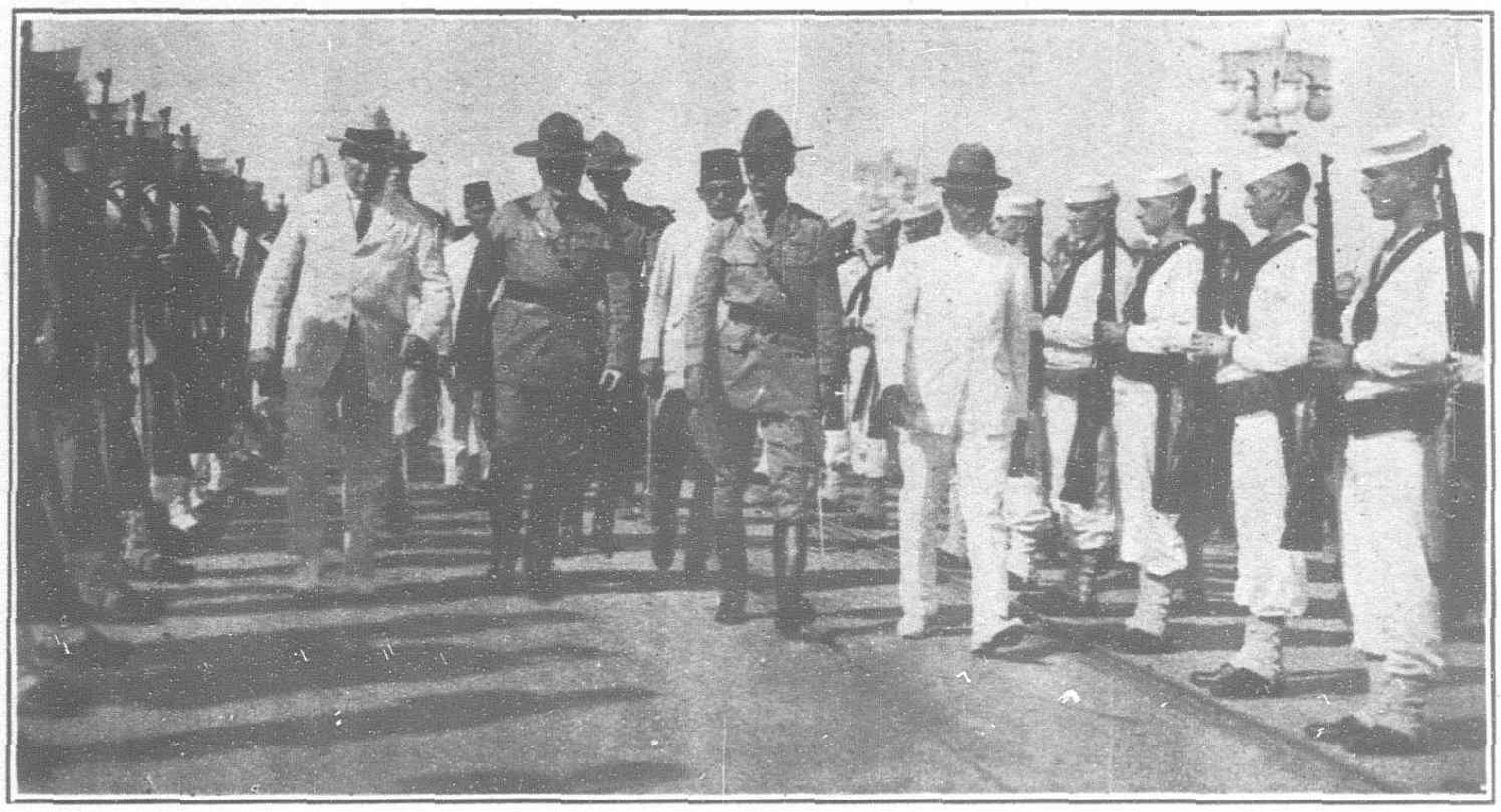
*Mr. Hoeck, who wrote this article for *The Far Eastern Review* was with the Carmi Thompson Mission, as Correspondent for the *New York Evening Post* and *The Philadelphia Public Ledger*.



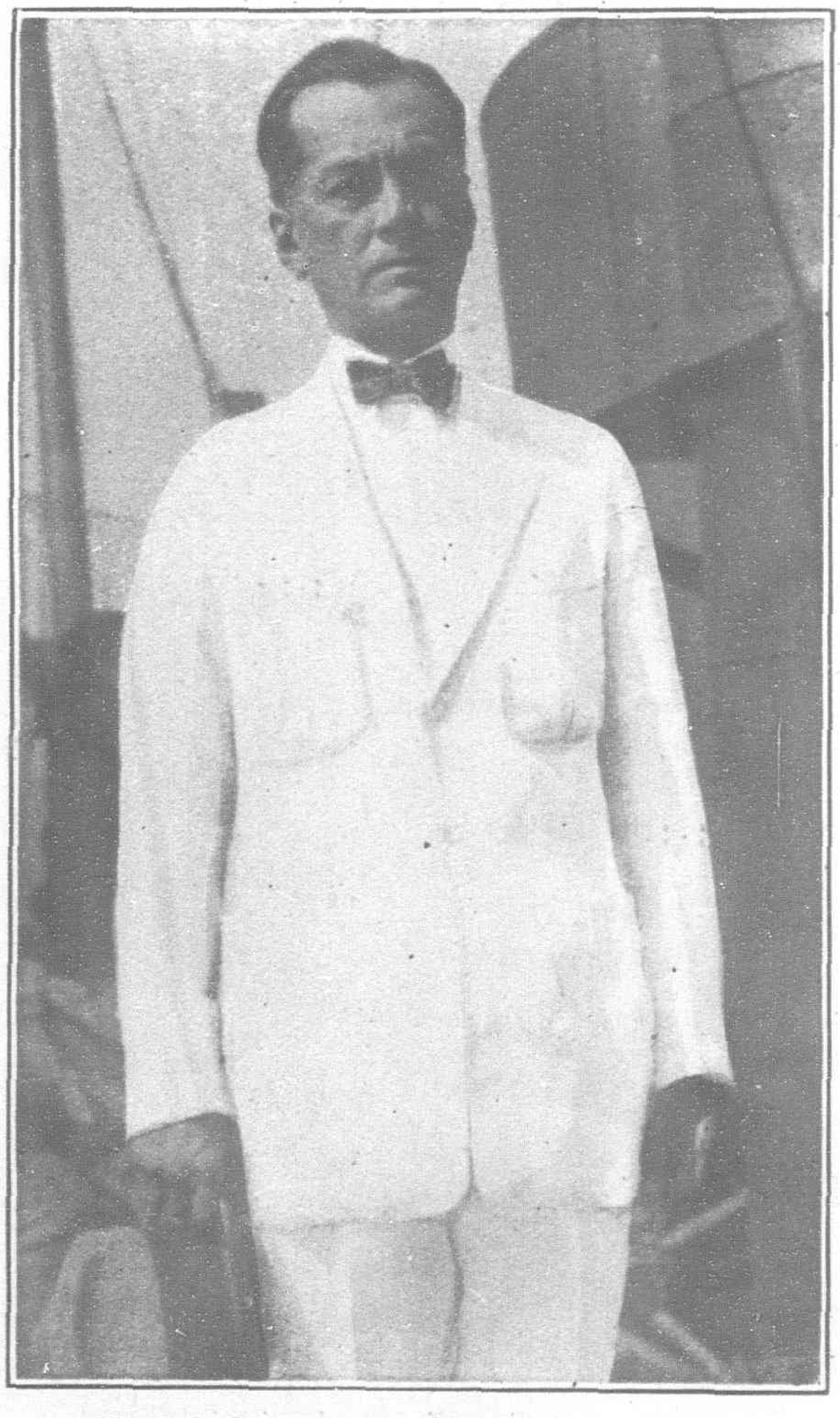
Governor-General Wood in Mindanao

interference of political leaders in the general supervision and control of departments and bureaus and the infection of the civil service with politics. Disastrous socialistic experiments were made and the Philippine National Bank lost $35,000,000—one of the darkest pages in Philippine history.

"As regards liberty, Lord Northcliffe was right when he said that the Filipinos had more liberty than any other people in the world—shielded from external and internal molestation, lowly taxed, surrounded by the safeguards and administrations of science, blessed with churches and schools and communications, left entirely free to use their hands or brains as best they can, launched on an even keel on the mainstream of modern progress.

"It is precisely because we love liberty that we are disinclined to leave these Islands prematurely and permit them to relapse into slavery. We came into the Philippines, not to take away, but to give, liberty. We cannot accomplish our task by scuttling. Filipinos can have liberty only if they accept it from the Americans in the form of that comprehensive culture and discipline, those moral, intellectual and civic virtues which alone can make liberty possible.

"I note a Filipino leader's remark that, while his people are grateful for what America has done, they cannot pay their debt in the currency of dependence. We are not asking for gratitude. Our aims are not so low as that. Our aims are to found a strong, free, Christian nation in the West Pacific, for the sake of that nation, ourselves and our fellowmen in general."



Manuel Quezon, President of the Senate

Such were the views of the late Governor-General and it is necessary to quote them at such length in order to get a key to the greatness of his aims, the magnanimity of his vision, and the soundness of his beliefs. To translate these views into the results of his work during these last six years, a bird's eye view of the whole term of conflict and drama that surrounded this stormy administration is equally necessary.

The late Governor-General, who, in addition to being a diplomat of ideals, a statesman of skill and an administrator of great strength, was also one of America's greatest experts on the Philippines, due to his early contacts. He was appointed to his post in 1921 after the Wood-Forbes Special Mission to the Philippines, after he had seen the generally deplorable condition of the Islands, had resigned from a lucrative position as Provost of the University of Pennsylvania, and had spent several arduous months in investigating all parts of the Philippines.

General Wood assumed office with all these discouraging circumstances and with the still more important factor against him of the divided sovereignty between his office and the Legislature. He relied, however, upon Congress to make certain modifications to the Jones law, as recommended in the report of the Wood-Forbes mission. No change ever was made.

With the divided sovereignty, affairs rapidly drifted into a deadlock, the Governor-General insisting upon certain reforms in the Government, while the Filipino political leaders refused to yield an iota of the authority which had been partly delegated and partly usurped during the Harrison régime. This deadlock lasted during the greater part of the Wood Administration.

Few of the Governor-General's recommendations were carried out by the Legislature, but there was one winning card, the power of veto, which made it possible for the Governor to checkmate any of the plans of Manuel Quezon and his lieutenants. By this means, and by re-assuming some of the prerogatives of office which had lapsed during the incumbency of his predecessor, the Governor-General slowly put into effect most of the major measures so essential to restoring the Philippines to normalcy.

At one time during the period of non-co-operation on the part of the Legislature, all appropriations, including that for the Governor-General's salary, were refused. The Governor found a provision in the act whereby the appropriations for the preceding year applied in such a contingency. That effectually blocked the first move. A move by General Wood, the abolition of the extra-legal Council of State, intensified the opposition. The Cabinet members refused to attend the meetings, and finally resigned in a body. This form of protest only amounted to a sacrifice on the part of the Filipino Department heads, for the Government was carried on, and is still functioning, with provisional secretaries.

If at any time, the Governor-General had so wished—and this is important in view of his relations with the American business men in Manila—he might have resorted to drastic, extra-legal measures to gain his ends, but at no time did the Governor-General exceed his legal authority. The hot-headed, intolerant Spanish-American war veteran aristocracy of Manila, impatient with what they described as dallying tactics, actually made petition to Washington for Wood's removal, and this antagonism did not abate until shortly before his departure on his last trip to America.

It was in the last few months before leaving that he succeeded beyond the expectations of any in getting the Government out of business. This had long been a matter of dissension because it provided a loophole for the disbursements of huge sums for public utility enterprises, none of which were on a paying basis. During the Harrison régime, the Government had started a coal mine, sugar centrals and other corporations, all of them managed by a Board of Control consisting of the Governor-General, Quezon and Roxas, so that the Governor-General was invariably out-voted on any important measures affecting these enterprises.

The Governor had maneuvered for five years, awaiting an opportunity to end this situation and when the time was ripe and the executive order was issued last May, there was a loud protest from the Legislature, and another attempted non-co-operationist movement, but the ammunition of the politicians was even less effectual then than before, and the Governor reigned in undisputed command of the field.

On previous occasions there had been attempted mutinies of the Philippine Scouts, attempted boycotts of American goods, and there still is a definite disposition towards excluding American capital, but the agitation to this final, crowning stroke of the Governor-General this time flared up in threats and before his death appeared to have dissipated completely.

While it cannot be said that the Governor-General completely restored the Islands to the status enjoyed prior to the accession of Harrison, that they have yet "been launched on an even keel on the mainstream of Modern progress," or that all the harm of the eight years previous to General Wood's assumption of office has been undone, no man living could have accomplished all that in the last six years in the face of such impossible conditions. For during that period most of the signs of American occupancy and American penetration had vanished. Save for a few isolated instances, they are still conspicuously absent. It was the task of one man, working without adequate weapons against thousands for the regeneration of a race of twelve millions.

But this much, which is more than any ordinary appointee to the post could possibly have accomplished, Governor-General Wood did achieve: widespread improvement of health and sanitation throughout the Islands, the exertion during those years of a moral influence aimed at greater efficiency in departmental work and the elimination of the corrupt, the restoration of exchange by increasing the bonded indeptedness when the Philippine National Bank was on the verge of failure, bettering the lot of the peasant class by fighting usury and peonage, impressing upon the Filipinos the human, civilizing ends that America seeks to gain in the Philippines.

While it is true that economically, the Philippines have failed to progress rapidly, that the huge reservoir of rubber capable of supplying the United States with most of its supply remains for the most part undeveloped, and that in other ways opportunities have been neglected, which is one of the facts that was used by the Americans in Manila as being intensely critical of Governor-General Wood, this again was a matter in which he was powerless to act without more authority and in which, if he had acted, he would have defeated the higher ends he was trying to serve.

Manuel Roxas, Speaker of the House

Given the intellectual and moral stamina that the Governor was endeavoring to inculcate into the Filipino, and all this would come simultaneously. A sterner hand, in any event, might have loosed a typhoon of bloodshed and disorder that would have put the Islands much farther behind in every way. Restraint under the circumstances was not only admirable and revealing of unsuspected traits in Wood, the military man, but was the wisest course to pursue.

What the late Governor-General has been able to accomplish in the Philippines, the greatest measure of success possible and far greater than was deemed possible, has enabled his successor, whomever the Administration may select, whether Carmi Thompson, who is not likely to accept, Senator Wadsworth, Henry L. Stimson or former Governor W. Cameron Forbes, to go to the Malacanang in an assured position. His authority has been strengthened, regardless of an indifferent and vacillating Congress, he will find a firm foundation of good-will towards the office of the "G.-G," implanted in the minds of the Filipino masses, and more than that, he will find a determination in evidence on the part of most of the Filipino government officials to make their work as efficient as they can.

A vivid figure in American history, Governor-General Wood has left his most vivid impression in Oriental America, has achieved his greatest and most dazzling success there, and if the United States estimates the work of its "pro-consul" discerningly, they will see in the late Leonard Wood, not only the master mind of a general, a diplomat and a statesman, but of a great American missionary, an idealist with a background of practicability, an austere pioneer who fought, even as many of the earlier American heroes, against disappointment and odds, to interpret the highest doctrines of service to humankind.

Breaking the Treaties By Taxation

The Effect of Tariff Autonomy upon Foreign Trade: The Unilateral Abrogation of Treaties By the Nanking Government: The Abolition of Likin

By George E. Sokolsky

THE Nanking Government has involved itself in a series of diplomatic struggles with the foreign Powers, arising from an attempt to change the tax relations between Chinese and foreigners without a revision of the existing treaties. China stands in the peculiar position of being prohibited from the revision of her tariff without consent of those Powers with whom she is in treaty relations imposing upon her such limitations. At the Washington Conference it was agreed to give China a wider lattitude with regard to the tariff, and a commission was sent to this country which met in Peking and which was apparently prepared to meet China more than halfway. The American member of that commission was Mr. Silas Strawn. He came to this country prepared to show China every possible just treatment. In the course of the Conference the Powers waived the so-called Washington surtaxes and suggested a wider lattitude in the arrangement of tariff rates. At a committee meeting it was even proposed and favored that China should have full tariff autonomy on January 1, 1929, and that the pernicious, international tax, likin, should be abolished by that date.

Unfortunately for China, while this Conference was in session, China was in the throes of civil war. The delegates were required to treat the Chinese Government as a national entity, when, as a matter of fact, they were constantly being informed by various controlling groups in the provinces that any arrangement made with the Peking Government would be ignored by those provinces. The Nationalist Government in Canton was particularly vehement on this subject. They took the view that any agreements reached with Peking had for its object assistance to the Peking Government against them, and they frankly stated their decision to oppose such agreements.

The Conference was naturally embarrass by these conditions, but it finally came to an end when the Chinese delegates to the Conference ran away from Peking and left the foreigners without any Chinese Government with whom they could continue negotiations. The foreign delegates remained in Peking for some time after this but were unable to discover anywhere in that city any Chinese who were prepared to conclude the agreement upon which Chinese and foreigners had worked for months. In despair they left Peking and returned to their own countries.

Conference a Failure

Nothing was accomplished at the Tariff Conference; nothing was decided; no agreement was written; no new treaty was made. Any suggestions, which may have been placed upon the agenda of the Conference, were of academic interest only. Nevertheless, the British Minister in Peking, at the end of last year, expressed his willingness that British subjects should pay the Washington surtaxes of 2½ per cent. above the 5 per cent. provided for by the treaties. The other Powers tacitily agreed to this and in due course the surtaxes were paid.

Nanking Reopens Question

The Nanking Government has now re-opened this question by a number of financial measures which have for their object the immediate establishement of tariff autonomy, without waiting for a revision of existing treaties between China and the Powers. These measures have met not only with a protest on the part of both Chinese and foreign commercial and industrial leaders but with a determination on the part of the foreign Governments that the new duties shall not be paid. It is necessary, therefore, to explain these measures in the greatest detail in addition to publishing the facts as provided by the official *Kuo Min News Agency*. The following official statement given out by the Nationalist Government, outlines the measures referred to in this article:

Official announcement is made of the momentous decision of the Nationalist Government to abolish Likin and effect a clean sweep of similar vexatious forms of taxation on goods in transit—which have hampered trade during the past sixty years and more. The new fiscal measures will assure free trade within six of the richest and most important provinces of the Chinese Republic, when the Government's mandate goes into operation on the 1st day of September next.

Abolition of Taxes

The proclamation of the Nationalist Government dated the 20th inst. declares that (1) likin of all descriptions; (2) all native customs duties whether within or without the fifty li radius of the open ports, or in the interior; (3) all principal and miscellaneous levies on goods in transit; (4) transit dues in lieu of likin; (5) coast trade duty; (6) duty on goods from one Chinese port to another; (7) destination tax (lo-ti-shui) though not strictly a transit duty,—all the foregoing will be totally abolished. Severe penalties are provided for any contravention of the law by collecting any of the taxes after their abolition.

Customs Tariff

Simultaneously with the abolition of likin and other taxes, and to make up for the loss of revenue which will follow as a consequence, the Nationalist Government, asserting China's right to tariff autonomy, will introduce a provisional customs import tariff whereunder, besides the existing five per cent. (5%) duty, there will be collected an additional seven and a half per cent (7½%) duty on ordinary goods; for luxuries, an additional duty of 15 or 25 per cent. according to classification; in the case of alcoholic liquors and tobacco products, the additional duty will be 57½ per cent.

Excise Duty

To place the burden of taxation on an equitable basis, the Government will also put into operation a Law on Excise Duty, whereby articles manufactured within the country will be made to bear an excise duty corresponding to the increased import duty on similar articles admitted into China.

These new fiscal measures will first be put into operation in the six provinces of Kiangsu, Anhwei, Chekiang, Fukien, Kwangtung and Kwangsi; and will be subsequently extended to other provinces. It is worth emphasizing that hereafter, under this new policy of the Government, once imported goods have paid the prescribed new duties at the port of entry, and locally manufactured goods, once they have paid the proper excise duty at the place of manufacture, will be freed from all further likin tax and other internal transit duties.

These decisive measures of the Government will stand out as a capital event in the history of trade in China; and, it is confidently believed, will be conducive to the rapid industrial and commercial development of China and a huge expanison of trade between China and foreign countries. What has been intermittently discussed for years past as a desirable and, indeed, imperative fiscal reform for China, will become an established fact by the decision of the Government which has determined boldly to carry out at one stroke what innumerable conferences and negotiations between successive governments in the past have failed to do.

Nationalist Government officials are confident that the new fiscal measures, the abolition of transit taxes and the exercise of tariff autonomy will be heartily welcomed by foreign governments and traders. It is recalled that the representatives of the Powers concerned have in the past expressed in unequivocal terms their entire sympathy with China's right to tariff autonomy. A new era will thus be inaugurated promising opportunity for those prepared to take advantage of the incalculable potentialities for trade in and with China.

Safeguarding Foreign Loan Obligations

In communicating the Nationalist Government's historic decision to the diplomatic representatives of the Powers concerned, Mr. C. C. Wu, the Minister of Foreign Affairs has also given the assurance that, as regards foreign loans and obligation, for which the Customs revenues have been pledged, adequate provision and safeguards will be made to meet all liabilities for the foreign loan service should the Customs revenues prove insufficient owing to the abolition of some of the taxes on transit which are at present collected by the Maritime Customs Administration.

Likin to be Abolished

It will be noticed that the Nanking Government first of all proposes to abolish certain taxes. Of these taxes the most pernicious is the likin tax which has been a hindrance to trade since its inception. Likin stations are scattered throughout the country, along the highways of trade and serve not only to burden trade with vexatious and whimsical conditions, but delay and hamper the movement of cargoes. This tax is particularly harmful to the Chinese exporter in the interior, who is sending goods to the great commercial markets for export abroad. In many instances, because of the operation of likin Chinese goods sold in China prove to be more expensive than similar goods imported from foreign countries. *The abolition of likin is a tremendous achievement, and the Government which accomplishes this will have served China well and will have established for itself an enviable prestige among the Powers.*

The difficulty is, however, that a vested interest has arisen in the likin stations, and it is now doubtful whether the Nanking Government is sufficiently powerful to abolish this tax throughout the territory in its control. At any rate, the attitude of the Foreign Powers and of foreigners living in China is that if likin is abolished, revision of the current treaties will be easier, but that there is no reason to change current conditions until likin has actually been abolished in the indicated territories. The general feeling is expressed that the new taxes will be collected while the old taxes will also be collected by local officials, and that the tax burden on commodities will be so high that all business will automatically cease. Two incidents have occurred which lay the basis for such an idea. One is that the province of Anhwei has declined to recognize the 50 per cent. tobacco tax which has been instituted by the Nanking Government and has insisted upon collecting an additional 20 per cent, which together with the customs dues, brings the tax on tobacco in the province of Anhwei up to 82½ per cent. The military authorities in Anhwei have gone so far as to state officially that the Nanking Government was not competent to collect the 50 per cent. taxes and that the tobacco merchants should only pay such taxes as are ordered by the military authorities on Anhwei province. Similarly, Chekiang province has a tobacco tax entirely of its own and means to collect that tax, irrespective of the 50 per cent. tax ordered by the Nanking Government, which it frankly recognizes as being its national government. These two instances alone have done more to frighten the foreigners into an assumption that even provinces, which recognize the authority of the Nanking Government, will not obey its mandates in matters of taxation.

The abolition of likin involves the Nationalist Government in a loss of approximately $40,000,000 annually. This loss, however, is not exactly that of the central Government, for most of the likin funds have in recent years been retained locally. In fact, one reason why any Government, if it has the will and the energy, can afford to abolish the likin taxes, is that the money is held by the likin collectors who have established a vested interest in this tax and who are utilizing their income to keep themselves in power. It is therefore to the interest of any governmental group to destroy their power within the state by taking from them these positions.

The Need for Funds

To the tax-payer, it would not matter so much if taxes in China were slightly higher, if the money were used for some purpose beneficial to the people. The fact remains that fully 90 per cent. of all taxes in this country are spent for military purposes. This fact is as true in South as in North China. The armies which are constantly making war upon each other permit the civilians to remain in power and do whatever constructive work they can do under present circumstances only because the civilians collect the taxes for them. The militarists of all sides are ruthless in their demands for money and their expenditures are without sense or order. As the wars grow more expensive, more money is constantly being demanded, until the people in many parts of China, can no longer pay.

The surest taxable source has been foreign trade. Goods coming into China through the Customs have paid duties, while the peasants perhaps failed to pay the land tax. Government financiers have sought to make foreign trade carry the full burden then of the exchequer. This is, of course, impossible financing, but in their desperation to satisfy the greed of the militarists, the financiers have not been able to think of any other expedient.

The Washington Conference surtax of 2½ per cent. has been mortgaged in Nationalist territory for some time to come. A loan of $30,000,000 was secured on this duty and therefore the Government no longer has an interest in it. They can get nothing from it. Whatever, it brings will go to the bankers. The $30,000000 have already been expended in fighting. Not one cent of it remains.

The Export Surtax

The Nationalist financiers therefore turn to other expedients, some of which are not only absurd but are harmful to China. The worst tax is the export surtax of 2½ per cent. The Minister who introduced and carried through this surtax is not only an economic simpleton but disregards the welfare of the people of China. He has levied on the produce of the Chinese people, so that they cannot sell their goods in the markets of the world. He has lessened the value of China's cargoes on the international market. He has devised a method of further taxing the peasant without increasing the amount of the land tax. He has reduced China's competitive capacity in foreign trade.

This surtax has not yet begun to work its full havoc but that will come in time, as the Spring and Summer cargoes are ready for export. The error of the export surtax is not only economic but political. The farmer is already dissatisfied because of disrupted condition; when he finds that his goods are thrown back on him because they cannot be moved easily throughout China on account of the civil wars and because they cannot be sold abroad on account of the export surtax, he will grow irate and will become again subject to the promptings of the Communist agitators. In a word, stupid financing, financing without regard to the welfare of the Chinese people, is bound to result in further uprising of the people. No Government can succeed which itself lays the groundwork for Communist uprisings.

The Excise Duty

It is difficult to imagine a more absurd retreat to outworn and useless taxation than the imposition of the excise duty by the Nationalist Government. The Minister of Finance responsible, Mr. Koo Ying-fang, simply has no idea of economic and industrial conditions in China. He is an old-fashioned official, accustomed to the small town methods of the city of Canton. He cannot think of great industries which require upbuilding, of hundreds of thousands of laborers who depend upon industry for their livelihoods, of the movement of goods and the wealth that comes to a country from economic activity. His purview is bounded by some small match factories and ivory shops in Canton, which have paid small taxes on their picayune products and who when they could not pay taxes, closed down. He thinks in terms of feudal taxation when the lord of the land got his share on everything produced.

Applied to Shanghai, this excise is ruinous. It will be seen from the Excise Law, which we publish herewith, that the Government taxes the goods exactly what the goods would have had to pay were they imported. This amount is fixed to prove to the foreign Powers that the purpose of the Government is not to discriminate against foreign manufactured articles. But Chinese products have not yet reached the position where they can compete with foreign goods on the basis of quality. All that is in their favor is cheapness. The Chinese manufacturer has been struggling for years seeking to build up industries against every possible odd, against poor capitalization, inexperienced management, inadequate protection under the law, whimsical taxation. Now, he is faced with the further impediment of an excise on his manufacturers, which means that he will have no alternative but to close down until such a time as the Chinese Government are prepared to protect him.

Many foreign manufacturers have brought their factories and mills to China and have invested hundreds of millions of dollars in this country because they sought to maufacture their goods in the environment of the purchasers so that there would be a better relationship between production prices and sales prices. The differential in favor of such a plan has been the lower wages of Chinese labor. The Japanese cotton mills which employ 70,000 workers and the British and American tobacco factories which employ 30,000 laborers are faced now with the necessity of closing down because of this excise. The Japanese cotton mills have already announced that in the event that the excise goes into force on September 1, their mills will close down on that date. That means that 70,000 laborers will be out of work and that 350,000 dependents will be without rice.

The Chinese cotton mills have petitioned the Government not to collect the excise, as they cannot afford to pay it. They show that they have been losing money since 1921 and that they have kept the mills running in the hope of some day building up a national industry. Now, they find that the Government is taxing them out of existence. They will have no alternative but to close down. The Government has promised them a subsidy if they would remain open, the subsidy being for the development of national industries. But there is no subsidy law and they do not know that they will ever receive the money. They would prefer not to get the subsidy if the Government will not collect the excise.

Other Chinese manufacturers find themselves in the same situation. They are now running skeleton organizations because they dare not close down. They fear that if they close their factories and mills, they may be arrested and punished as counter-revolutionaries and Communists. Yet to remain open, means that they have to operate at a loss.

Just as in the case of the export surtax, so in the matter of the excise, the principal harm is done not to foreigners but to the struggling Chinese producer of manufactured goods, who is being wiped out of existence to satisfy military greed.

The Nationalist financiers do not seem to realize that their cry for political equality will find no response until they have achieved economic equality. The present financial program seems designed to make China increasing dependent upon outside capital for industrial and commercial purposes. Chinese capital is being hoarded; it is being invested in real estate, diamonds, placed on fixed deposits and sent out of the country to New York and London in the form of gold deposits and investments in foreign securities. This is unsound from a national standpoint, for it will take generations to restore confidence in Chinese investments. It means that the huge accumulations of silver in China will gradually seep out of the country and will be of no benefit to China. It means that China will have to go begging in the money markets of the world for money on foreigners' terms for any reconstructive enterprises. And that money will be protected by treaties and by a gun-boat policy or it will not come to China. The excise duty then, in its final analysis, means a continuation of the very political conditions against which the Chinese so strenuously protest but which they themselves perpetuate.

The following is the Law of Excise Duty:

Law on Excise Duty

(Translation)

Article 1.—An excise duty shall be paid on all goods manufactured by Chinese and foreign factories located within the territories of the Republic of China.

The word "factory" in the preceding section shall be construed to mean a factory in which the machinery is driven by electric, steam, or hydraulic power and in which ten or more workmen are employed.

Article 2.—The rates of the excise duty shall be the same as the corresponding rates of the customs import duty on goods of the same nature and description. The duty is payable in the national currency.

Article 3.—The rates of the excise duty on goods which are not enumerated in the list of customs import duty shall be the same as the corresponding rates of the customs import duty on similar articles, and shall be calculated on the basis of the wholesale prices of such goods.

Article 4.—The excise duty shall be collected by special excise collection bureaux created by the Ministry of Finance in the different provinces.

Article 5.—Goods on which the excise duty has been paid in full shall be exempt from further taxation within the country.

Article 6.—If any duty has been levied on raw materials for the manufacture of goods on which excise duty has been paid in full, the duty paid on such raw materials shall be refunded. The basis and procedure for calculating the amount to be refunded shall be fixed by special regulations.

Article 7.—When goods on which the excise duty has been paid in full, are exported to foreign countries, the exporter may surrender to the customs authorities at the port of exit the transportation permit as specified in Article 9 in exchange for an export permit, free of export duty.

Article 8.—The excise collection bureaux shall have the right to inspect the manufacture, warehousing, as well as entry and exit of goods in all factories located within their respective administrative jurisdiction. Any factory which fails to declare or declares falsely any goods shall be liable to a fine not exceeding ten times the duty payable on such goods. If any criminal act is thereby committed, the offender may be handed over to the judicial authorities to be dealt with accordingly.

Article 9.—Except as otherwise provided in Article 10 concerning goods transported from factories to their own warehouses or to those specially designated by the competent excise collection bureau, no goods may be transported out of the factories without having previously obtained a transportation permit which is issued in exchange for the excise duty certificate showing that the excise duty on the goods has been paid in full. Such certificate is issued by the competent excise collection bureau upon notification by the factories concerned and after examination and appraisel by officers designated by the said bureau.

Article 10.—With regard to goods transported from the factories to their own warehouses or to those designated by the competent excise collection bureau, the collection of the excise duty may be deferred until the goods are removed from the warehouses, in which case a transportation certificate is issued before the removal upon payment in full of the excise duty; provided that before transportation from the factories a warehouse certificate is obtained from the competent excise collection bureau upon notification by the factories concerned and after examination by the officers designated by the said bureau.

Article 11.—Goods which are transported out of the factories or warehouses in contravention of the provisions of Article 11 and 12, or on which the excise duty has not been paid in full, shall be confiscated upon discovery.

Article 12.—The transportation certificates shall be issued in triplicate by the Ministry of Finance and sent to the various excise collection bureaux to be filled in and stamped by the latter. Of these triplicates, the first portion shall be filled with the excise collection bureau, the second shall be kept on file and remitted each month to the Ministry of Finance; the third shall be retained by the transporter.

Article 13. Any merchant who considers as illegal any ruling or order of the excise collection bureau or is dissatisfied with the interpretation of the provisions of the laws concerning taxes, may pay the excise duty under protest, and may petition for relief according to law.

Article 14.—Any merchant who is dissatisfied with the determination of the nature of the goods or appraisal of the value thereof made by the excise collection bureau, may lodge a protest with the said bureau, wherupon an Appraisal Commission shall be constituted to decide the matter.

Article 15.—The detailed regluations for the enforcement of this Law shall be issued by the Ministry of Finance.

Article 16. This Law shall come into force on the first day of September of the Sixteenth year of the Republic of China.

The Luxury Surtaxes

The luxury surtaxes present an exceedingly difficult problem. At the Tariff Conference in Peking, the leading experts of all the important trading Powers met with China's leading tax experts and they worked out a schedule of luxury surtaxes, which were on the whole approximately 50 per cent. lower than the Nanking surtaxes. The Peking Conference recognized the principle that until Tariff Autonomy was finally recognized these surtaxes should be regarded as binding for the interim period as under the treaties. There was no attempt at this conference to impeach or abrogate existing treaties although the very meeting of the Conference meant the alteration of the commercial treaties.

The Nanking Surtaxes altogether disregard the treaties. Here is an attempt to make one source of revenue, foreign trade, bear the whole or the largest part of the burden of government finance. All treaty relationships are ignored in this attempt. The contention of the Nanking Government is that as long as the Powers do not even recognize Nanking as a *de facto* Government, so far as Nanking is concerned, no treaties exist between them and the foreigners. The Powers contend that as long as Nanking continues to break the treaties, it is impossible for the Powers to deal with Nanking. Thus there is a vicious circle which leads nowhere except to conflict between Nanking and the Powers and a loss of revenue to the Nanking Government. For whereas, with regard to the increased tonnage dues, to which detailed reference is not being made in this article, the shippers are paying the old rates into their Consulates, which act as self-appointed trustees for the Chinese Maritime Customs, and the ships clear on consular certificates, so with regard to the luxury surtaxes, the importers are taking the cases into their own courts which function under the Treaties and which must recognize the provisions of the treaties as law of the land. With regard to the tobacco tax, Chinese dealers are smuggling cigarettes into their cities without paying any taxes. Whereas, tobacco should being the Nationalist Government close on to $1,000,000 a month under their tax scheme, it brought during July only $120,000 and only about $30,000 for the first half of the month of August. If is not that the trade does not wish to pay taxes; trade wants less politics and more business and would pay any taxes that the trade could bear, if there were trade and if some regard were paid to the differential between the purchasing power of the people and the increased cost of goods due to high taxes.

The principal criticism of the Nationalist Government in attempting to change fundamentally the age-long system of Govenment finance, is that such changes can only be made by a Government secured in its position by public consent and at a time when there is peace and prosperity, so that the shock of change can be absorbed without complete dislocation of the economic life of the people. The Nationalist Government is not at present in that position. It is, in fact, disorganized and cannot control the territory which it claims as its own. The union of Nanking and Hankow may in time produce a Government for South China which will be modern, effective and follow the principles of Sun Yat-sen. But that time is not here, and meanwhile, the Nanking Government is endangering its own position by premature tax reforms, which frighten the Chinese and give to the foreigners the impression that the Government seeks to drive foreign trade and foreign industry out of the country. At a time, when the full energies of the Nanking Government are being consumed in an effort to establish itself on a permanent basis, when it is still uncertain what that basis is to be, when it is not known what will constitute the reorganized Government, or how long will be its tenure, it is fool-hardy to make such fundamental changes. There is not the faith and confidence to support such changes. There is not the business security to risk investments until the full economic effects of the changes are made evident.

The following are the laws passed by the Nanking Government, affecting the Luxury Tariff :

Proclamation of the Nationalist Government of the Republic of China

(Translation)

The increasingly deplorable economic condition of our people is due not only to the defects of our political institutions, but also externally to the limitations imposed by a conventional customs tariff in force since the past few decades, and internally to the oppressive system of likin, which has resulted in impeding the free circulation of goods and the development of industry. The Nationalist Government of the Republic of China, fully conscious and ever mindful of the heavy responsibility entrusted to it by the people, is profoundly convinced that unless the obnoxious system of likin and duties of a like nature be totally abolished, the economic development of the nation cannot be realized and the people cannot be relieved of their sufferings. The Nationalist Government is also convinced that the customs tariff contained in the unequal treaties is incompatible with a nation's sovereignty, and that tariff autonomy should immediately be put into force as an initial measure towards securing an equal status in the family of nations. In view of these considerations, it is decided to abolish the likin system and to proclaim China's tariff autonomy within the shortest possible period.

Likin was originally a kind of transit duty ; it was instituted as a temporary measure, but gradually numerous abuses have grown up in connection therewith, and the system has continued to the present day. Furthermore, for the sake of revenue, the maladministration of former Governments has resulted in the setting up of numerous sub-stations for levying all kinds of duties, similar in nature to likin, on all kinds of goods, a state of things which has brought untold hardship to merchants. Realizing that not only Chinese merchants, but foreign merchants as well, have suffered under the existing system of taxation to the detriment of the entire nation, the Nationalist Government has decided to eradicate this obnoxious fiscal régime, which has been in existence for the past few decades, thus realizing the earnest wish of Chinese and foreign merchants. The abolition shall take effect in the six provinces of Kiangsu, Anhui, Chekiang, Fukien, Kwangtung and Kwangsi, and shall later be extended to the other provinces. All levies of whatever description that are in the nature of a transit duty, such as all native customs duties, tnng-chuan, tung-shui, huo-wu-shui, railway huo-chuan, parcel post likin, transit dues in lieu of likin, coast-trade duty, duty on goods from one Chinese port to another, and all principal and miscellaneous levies which are in the nature of tax on goods in transit, shall, one and all, be completely abolished. Besides, the lo-ti-shui, which is not a transit duty, but which is harmful to the people, shall be abolished simultaneously with likin. Thus a new era will be inaugurated for the poeple.

Tariff autonomy has long been ardently desired by the entire nation. The Nationalist Government, in response to the economic and financial needs of the people and in conformity with the general principle of equality of states, has now decided to put into force a national tariff. It is therefore necessary to promulagte a new customs tariff for imported goods in harmony with present day requirements, and at the same time to impose an excise duty on all goods manufactured in the factories located within the country, so that there may be equalization of taxation. All the aforesaid new measures constitute one of the principal items of the reconstruction scheme, the putting into effect of which has long been advocated and indicated by Dr. Sun Yat-sen. The Nationalist Government feels itself in duty bound to put these measures immediately into operation so that the wishes of the revered leader and the hopes of the people may be realized. Be it known that the Law on Abolition of Internal Transit Duties, the Provisional Law on National Import Tariff, and the Law on Excise Duty have this day been duly promulagated. The first day of September of the present year has been fixed as the date for the abolition of likin, and the same day has been fixed for the proclamation of tariff autonomy. All kinds of transit duties shall be completely abolished in the six provinces of Kiangsu, Anhui, Chekiang, Fukien, Kwangtung, and Kwangsi. The duty on imported goods shall thereafter be paid according to the new rates specified in the national tariff, and the excise duty on goods manufactured within the country shall be paid according to the rate specified in the Law on Excise Duty. It is hoped that these measures will help to revive trade, which has hitherto been hampered, and to promote industries which have remained undeveloped. The Ministry of Finance will be instructed to notify the Commissioners of Finance and the Superintendents of Customs in the six provinces of Kiangsu, Anhui, Chekiang, Fukien, Kwangtung, and Kwangsi to act accordingly, and the present proclamation is hereby issued for the information of Chinese and foreign merchants. July 20, 1927.

Provisional Law on National Import Tariff

(Translation)

Article 1.—Foreign goods imported into China upon arrival at an open port shall pay duty at the rate fixed by this Provisional Law.

Article 2.—In addition to the existing five per centum (5 per cent.) duty, goods as specified in the previous article shall be subject to an import duty as follows :

Ordinary goods, at the rate of seven and a half per centum ($7\frac{1}{2}$ per cent.) ;

Luxuries, Class A, at the rate of fifteen per centum (15 per cent.) ;

Luxuries, Class B, at the rate of twenty-five per centum (25 per cent.) ;

Luxuries, Class C, at the rate of fifty-seven and a half per centum ($57\frac{1}{2}$ per cent.).

The aforesaid duties shall be on a specific or *ad valorem* basis according as they are specific or *ad valorem* under the existing customs tariff.

Article 3.—From the day when this Provisional Law comes into force, the existing two and a half per centum ($2\frac{1}{2}$ per cent.) surtax on imports and the surtax on luxuries shall be abolished.

Article 4.—A schedule of the different classes of luxuries designated A, B and C respectively in Article 2 of this Provisional Law is appended hereunto.

Article 5.—All dutiable imported goods which do not come under any one of the three classes of luxuries shall be considered as ordinary goods.

Article 6.—All prohibited articles and duty-free articles as well as those which are duty-free by special permit shall be governed by the existing regulations relating thereto.

Article 7.—This Provisional Law shall apply to goods passing through the Custom Houses at the land frontiers.

Article 8.—This Provisional Law shall come into force from the first day of September of the sixteenth year of the Republic of China.

Law on the Abolition of Internal Transit Duties

(Translation)

Article 1.—In order to lessen the burden of vexatious taxation borne by the people and to improve the system of taxation, all internal transit duties, whether collected by the central or local authorities, shall hereafter be abolished.

Article 2.—The following internal transit duties shall be abolished :
- (*a*) Likin, Tung-chuan, Tung-shui, Huo-wu-shui, Railway huo-chuan, Parcel post likin ;
- (*b*) All native customs duties, whether within or without the fifty (50) li radius of the open ports ; all native customs duties in the interior, except those collected by the Native Custom Houses on imports and exports at the land frontiers ;
- (*c*) All principal and miscellaneous levies which are in the nature of tax on goods in transit.

Article 3.—The following duties levied by the Maritime Customs in the open ports shall be abolished :
- (*a*) Transit dues in lieu of likin ;
- (*b*) Coast-trade duty ;
- (*c*) Duty on goods from one Chinese port to another.

Article 4.—The lo-ti-shui (destination tax) shall be abolished simultaneously with transit duties.

Article 5.—All Native Custom Houses which collect duties on imports and exports at the land frontiers shall hereafter be designated as the Land Custom Houses and shall be governed by the provisions of the Provisional Law on National Import Tariff and of the existing regulations on exports.

Article 6.—As regards those Native Custom Houses which collect duties on imports and exports on the seaboard, the Ministry of Finance shall amalgamate them with the Maritime Customs or instruct the Maritime Customs to establish sub-stations in lieu thereof, as it may deem fit.

Article 7.—Any person who, after the coming into force of this Law, is found guilty of collecting any of the duties enumerated in Articles 2, 3 and 4 of this Law, under any pretext whatsoever, shall, in addition to making restitution of the amounts thus collected to the person or persons concerned, be punished with imprisonment of from the first to the third degree, and may further be liable to a fine not exceeding ten thousand dollars ($10,000).

Article 8.—A person in military service who commits an offence under the preceding Article, shall be tried and punished by the competent military authorities.

Article 9.—This Law shall come into force on the first day of September, the sixteenth year of the Republic of China.

Schedule of Luxuries Appended to Article 4 of the Provisional Law on National Import Tariff

CLASS A.

(Treaty Duty 5%—Luxury Duty 15%=Total 20%).

1.—Silver Watches.
2.—Flasks (pocket), and Thermostatic Containers of all kinds, and parts or accessories thereof.
3.—Games and Sporting Requisites, except playing cards.
4.—Photographic and Cinematographic Products, Apparatus, and Materials of all kinds (except Chemicals), and all other Paraphernalia used in connexion with the taking, developing, or exhibition of pictures, and all parts or accessories thereof.
5.—Typewriters, Calculating Machines, Cash Registers, Copy Presses, Duplicating Machines, and all other Office Machines.
6.—Electro-plated Ware ; Hair Cutters, Knives, Razors, Scissors, and all other Cutlery and parts or accessories thereof (not including Tools).
7.—Safes, Cash Boxes, and Strong Room Doors.
8.—Furs, Dressed or Tanned.
9.—Animals' Teeth and Tusks, but excluding Ivory of all kinds.
10.—Fragrant Wood, Scented Wood, Garoo Wood, Sandalwood, and all other Odoriferous Woods.
11.—Macaroni, Vermicelli, Spagetti, and similar Products.
12.—Fresh Fruits.
13.—Aerated Waters.

CLASS B.

Treaty Duty 5%--Luxury Duty 25%=Total 30%).

14.—Amber, Pearls, Tortoiseshell, Agate, Coral, Cornelian, Rock Crystal, Diamonds, Emeralds, Opals, Red Quartz, Rubies, Sapphires, and all other Precious or Semi-precious Stones, real or imitation and all articles made wholly or partly thereof or decorated therewith.
15.—Jewellery of all kinds, real or imitation.
16.—Platinum, and White Gold, and all articles made wholly or partly thereof.
17.—Goldware (Solid, filled, rolled, plated, or washed).
18.—Metallic Foil or Leaf of all kinds.
19.—Watches with cases made wholly or partly of platinum, or gold ; or of silver decorated with jewels.
20.—Silverware and Silver-plated Ware.
21.—Ornaments, Damascene Ware, Ivory Ware, Satsuma Ware, Lacquer Ware, Pictures, and all Decorative, or Ornamental Articles whether for personal, household, or other use.
22.—Curious and Antiques.
23.—Works of Art, such as Etchings and Engravings, Paintings, Drawings, Statuary, Sculptures, and/or copies, replicas, or reproductions thereof.
24.—Bells and Gongs.
25.—Musical Instruments and parts or accessories thereof.
26.—Glass Ware, "Crystal" and "Semi-crystal," Cut and/or Polished (*i.e.*, all articles made wholly or chiefly of glass, except common, coarse, moulded or pressed, unpolished glassware).
27.—Satchels, Card Cases, Pocket Books, Purses, Jewel Cases, Fancy Boxes, Portfolios, Trunks, Suit Cases and Travelling Bags or Boxes of all kinds ; Walking Sticks ; Tobacco Pouches and Pipes and parts thereof ; Cigar and Cigarette Holders and Cases, Match Boxes, and all other Smokers' Requisites and Tobacconists' Sundries.
28.—Toilet Articles, Preparations, or Requisites, such as Perfumery, Cosmetics, Shaving Soap, Face Cream, Tooth Paste, Talc or other Toilet Powder, Hair Tonic, and all other preparations for the hair, mouth, teeth, or skin ; Sponges, Toilet Brushes, Combs ; Manicure Sets or parts thereof, Powder Puffs or Cases, Vanity Cases, and all other Fancy Toilet Equipments.
29.—Arms and Ammunition for personal or sporting use.
30.—Motor Vehicles of all kinds (assembled or in parts), including Motor Cycles, Motor Cars, Motor Chassis, and all other Motor Vehicles not otherwise specified, and all parts, tires, and other accessories for any kind of Motor Vehicles, but not including complete Motor Passenger-Vehicles (*i.e.*, Motor Char-a-banc, etc.) with seat for not less than eight passengers, or complete Motor Trucks or Motor Lorries over one ton carrying capacity.
31.—Natural Silk in any form including Silk Piece Goods and all other products which consist wholly of Natural Silk.
32.—Imitation Fur Cloth except that made of pure cotton.
33.—Upholstery Fabrics, (*i.e.*, Furniture Plushes, Velvets, and Tapestry made of any material ; Unenumerated Upholstery Fabrics not made entirely of cotton ; Upholstery Trimmings such as Braid, Cord, and other fancy goods made of any materials).
34.—Curtains, Window Blinds, and Hangings of similar nature.
35.—Real or Imitation Gold, Silver, or other Metallic Thread (on cotton, silk, or other material) ; Spangles, Tinsel and Tinsel Wire ; and all other Trimmings and Trimming or Decorative Materials, metallic or other, except those made wholly of cotton ; Lace, Edging, Insertion Veilings and similar Nettings, Millinery, Braid, Embroidered Goods, and all other materials or products used for decorative or ornamental purposes, except those made wholly of cotton ; and all articles made wholly or partly of any commodity mentioned in this item or decorated therewith.
36.—Boots and Shoes, Hats and Caps, Hoisery, Drapery, Haberdashery, Clothing, and all other articles of personal wear and parts or accessories thereof (except Cotton Underclothing stitched with silk thread and/or faced with silk or artificial silk cotton socks and stockings stitched or embroidered with silk and any goods made entirely of cotton).
37.—Umbrellas, Sunshades, and Parasols.
38.—Leather Manufactures of all kinds, except Leather Belting for Machinery.
39.—Feathers, and all articles made wholly or partly thereof.
40.—Wall Paper.
41.—Ginseng, Cow or other Bezoar, Old and Young Deer Horns (*i.e.*, Medicinal), Rhinoceros Horns, Musk, Camphor of all kinds, including Camphor Baroos or Borneols, real or imitation.
42.—Bird's Nests.
43.—Awabi.
44.—Fish, Maws.

45.—Meat Extracts.
46.—Sharks' Fins.
47.—Sinews, Animal.
48.—Playing Cards.
49.—Asparagus.
50.—Bacon and Ham.
51.—Beef, Corned or Pickled.
52.—Biscuits.
53.—Caviare.
54.—Cheese, Butter, Lard, Margarine, and Substitutes thereof.
55.—Chocolate, Cocoa, and Coffee (in any form).
56.—Confectionary.
57.—Fruits, Dried or Preserved.
58.—Honey.
59.—Jams, Jellies, and Canned or Bottled Foods of all kinds except Cream and Milk.
60.—Oil, Salad or Olive.
61.—Sauce and all other preparations, extracts, or substances for flavouring goods except Soy.
62.—Sugar, Cube and Loaf.
63.—Sugar, Candy.
64.—Syrup, Table.
65.—Syrup, Fruit.
66.—Tea.
67.—Aniseed Star, Cardamons, Cloves, Nutmugs, Pepper, and all other Spices and Condiments.

Class C.

(Treaty Duty 5%—Luxury Duty 57½=Total 62½%).

68.—Cigars and Cigarettes.
69.—Tobacco, Prepared ; and Snuff.
70.—Wines, Spirits, Liqueurs, Ales, Beer, Stout, Porter, Cider, Perry, and similar Liquors made of fruits and berries ; and all other Alcoholic or Spirituous Liquors or Beverages.

How the Carter's Ink Company Protected its Trade-Marks in Japan

Disposing of a Common Popular Notion that the Japanese Courts Favor their own Nationals in Such Cases

By Walter F. Wyman, General Sales Manager, the Carter's Ink Company*

FOR more than a quarter of a century we have shipped inks and adhesives in volume to Japan. In the years which have elapsed we have yet to lose our first dollar by reason of non-payment by a Japanese customer. Our only loss in a quarter of a century was in connection with a European partnership. This is mentioned at the outset so that there may be no possible misconception of our definite and proved knowledge of the entire responsibility and business honesty of the Japanese wholesalers and retailers who have been our good friends and loyal customers. It is only fair to add that our experience is not unique—that with slight variation it is the experience of veteran American exporters.

Twenty-two years ago we appointed our first exclusive agency in Japan, and our records show that in that year we made substantial shipments of fountain pen inks and liquid ink erasers. These articles, marketed most skillfully by trade connections, naturally resulted in a steadily increasing sale—and evidently attracted the attention of an individual who decided to profit unfairly by the demand that they enjoyed.

In 1915 our attention was first directed to the imitation of Carter's fountain pen ink and Carter's "Ink Racer." The World Ink Company brought out packages which duplicated ours even to the fine scrollwork in the booklet, with the exception of using the word "Card's in place of "Carter's." This amount of caution was doubtless due to the fact that "Carter's" was registered in Japan, covering our several lines of products, on June 15, 1906.

A most unusual situation came into existence in the fall of 1922, when the World Ink Company of Nagoya, Japan, wrote us seeking to exclude us from selling our own merchandise in Japan, claiming that certain of our packages were infringements on their trade-marks as registered in Japan. Entirely apart from the present and future profits involved, we felt that it was our duty to protect the profits of our customers in Japan who had so loyally featured our line for so many years, and that we had a duty to all export manufacturers in the United States and other countries whose products were shipped to Japan.

After consultation with our patent and trade-mark attorneys, Messrs. Coale & Hayes, a course of aggressive action was determined upon with their full guidance. The next step was through the eminent British representatives of Messrs. Coale & Hayes—Messrs. Haseltine, Lake & Co., of London. The third contact was with their most able Japanese associate, Dr. Souchi Kishi, of Tokio. In early 1923 our plans were complete. Dr. Kishi was co-operating with our resident agent in Japan, Mr. T. Tamura. The Department of Commerce had been consulted through the Bureau of Foreign and Domestic Commerce and had assured us that the American Embassy would render all services possible to Dr. Kishi.

After an investigation which it made in our behalf, it advised us that they believed that our rights in connection with the matter were paramount. This was in the face of opinions which we received from several sources that the Japanese law recognizes only through registration and at first glance that the World Ink Company had a right to use the designs on our labels, with the exception of the word "Carter's" provided they were the first registrant.

Thorough preparation of evidence showing prior use of the contested designs and other documentary evidence were supplied to our attorneys. On October 28, 1925, Mr. T. Tamura reported the summons issued on October 6 to two of our good friends and customers, Mr. S. Fuiki and Mr. K. Ito, two most important stationery houses. The result of the case was foreshadowed by the eminent fairness of the trial of the case on February 23, 1926. A decision was handed down by the Japanese court in favor of The Carter's Ink Company against the World Ink Company. No protest was made, and the decision is no longer subject to appeal.

It will be noted that The Carter's Ink Company, instead of contenting itself with defending itself against a charge of infringement made by the World Ink Company, took definite, orderly legal action designed to bring about the cancellation of the very trade-marks issued to the World Ink Conpamy on which it was basing its effort to make it impossible for The Carter's Ink Company to market its own products in Japan.

It will also be noted that the Japanese court decided against one of its own nationals in favor of The Carter's Ink Company in a basis which, from all evidence before us, would seem to be clearly based on equity and common law rather than any adherence to the statute law which had been quoted to us as presumably applying to the case.

The point which I particularly wish to emphasize in this brief statement of facts is that in every country, including our own, there is an infinitesimal percentage of unscrupulous people who seek to profit by infringing upon the rights of others ; but that, entirely apart from our own felicitous experience in the matter of credit losses in Japan, this incident proves conclusively the safety *under the law* of building sales volume in Nippon by manufacturers who are, by this and other decisions, clearly recognized equally with Japanese citizens as having legal as well as moral rights which are to be scrupulously guarded by the Japanese courts.

**Export Trade and Finance*, May, 14, 1927.

The Elimination of General Chiang Kai-shek

By George E. Sokolsky

GENERAL Chiang Kai-shek played an important role in the affairs of the Kuomintang and was virtually the dictator of South China for the short period of the year. After that he eliminated himself from political life and retired to a temple outside of Ningpo, where he can think of the greatness which he might have achieved had he not sacrificed every political principle to achieve greatness. For it was Chiang Kai-shek who brought about split after split in the Kuomintang so that, by a process of elimination, he might rise to the principal position in the Party. It was Chiang Kai-shek who brought Borodin back to Canton in May, 1926, so that he might have arms and munitions for his Northern Expedition. It was Chiang Kai-shek who elevated the Marxian Teng Jan-da to a controlling position in the machinery of the Party so that he could utilize the propaganda agencies of the Communists in his interests. It was Chiang Kai-shek who overthrew the communists and attacked the very men who made his military successes possible, when they impeded his Napoleonic ambitions.

Foreigners in China, obsessed with the mania that there is no hope in this country except in a strong man, favor Chiang Kai-shek as they have in the past stupidly favored Yuan Shih-kai and Tuan Chi-jui. They seem to have learned nothing from Chinese history. They seem not to be able to realize that these so-called strong men in China invariably fail because they are not strong; they are tricky; they are masters of intrigue, but they have no fundamental strength. Chiang Kai-shek came closer to having a popular following than any of the other militarists but his popularity was almost entirely created by the Communist propagandists when they were his supporters and he lost it when they ceased to boost him. He went to Ningpo ten days before this article was written and already his name is but occasionally mentioned even in Chinese political circles and then, only in a reminiscent mood. He may return to public life, he may even some day lead an army to conquest—but he will never again play the role of an overshadowing leader in the Nationalist Movement.

General Chiang Kai-shek

The strength of the Kuomintang lies in its ability to absorb and withstand the shock of catastrophic failures. It goes through its failures and comes out alive. Dr. Sun Yat-sen used to boast that he failed 13 times and yet continued his work. Many times he was driven out of his base, Canton, by the very men he elevated to high position. But he always returned, while they are in oblivion, their names hardly known to the rising generation. The vitality of the movement depends upon its capacity to survive failures.

Feudalism in China, is different. The feudal lord does not expect to survive failure. When he fails he retires to some foreign concession or foreign country to enjoy the riches which he garnered in the days of power. Where are the great Tuchuns of 1924? It would perhaps be a better question to ask, who were they? Forgotten, lost to memory and history, they sit in Tientsin and Dairen and Shanghai playing small politics listlessly and hoping some day to get back into some position, but never quite being able to make the grade, because younger men and other times have written their obituaries. The only exception to this general rule is Marshal Wu Pei-fu, who, in a way represents something more than mere feudalism: he represents the ancient Chinese code of chivalric morals and ethics as lost to China as the glories of Don Quixote were lost to Europe of another age.

But the Kuomintang is in a different position. It may be incompetent. It may be radical, It may suggest tax programs which are ruinous to the country. It may associate itself at times with the Communists. Its faults lead to calamities; its incompetence leads to confusion. But to the average Chinese mind, it is the beginnings of a Chinese nation. It is often as unattractive as all beginnings, ugly efforts at big things by puny men. But whatever it is, it is Chinese and appeals to Chinese psychology. It represents to the Chinese mind a hope for the future. It lacks coherence because it depends upon the populace and the populace is of a divided mind. It lacks perfection of organization because its leaders have devoted their life experience to revolution rather than to administration. It lacks discipline because it must go back to the party locals for authority. In a word, it is the meeting-house days of democracy carrying through a feudal-military period, functioning over a tremendous area of a revolution-torn country. Yet, it somehow carries on. No calculations of the future of China can be made without it. No assumptions as to political activities in China can be made except on the basis that the Kuomintang will continue to make itself felt, openly or secretly, somewhere in China.

General Chiang Kai-shek was more suited to Northern feudalism than for the Kuomintang. He could not submit to Party discipline. He found the talkey-talk of the meetings irksome. He wanted to dictate, to control, to dominate. And the Party resisted him until he found himself in the impossible position of a leader without a following. That is what has happened to so many men in the Kuomintang who sought to control the Party individually. Somewhere in the mass organization of the Kuomintang is there this resistance to individualism. Somewhere in all the weakness of the moment, is there a hidden strength which keeps out the tyrant. Sooner or later, he must go as so many so-called powerful political figures have been forced to go in the Kuomintang. The passing of Chiang Kai-shek and Michael Borodin are characteristic of the same trend : no dictatorship by an individual. The Party had rather suffer defeat and remain democratic than enjoy victories under a dictatorship.

Some foreigner in China, new and inexperienced, fresh to conditions here, have sought to make a mythical figure of Chiang Kai-shek. They have sought to develop him as a grandiose personality who eats foreign food with a knife and fork instead of with chop-sticks, who mysteriously moves hidden forces beneath the surface, like some detective-story account of a Chinese highbinder. All that is the childish trivialities of sensation seekers who see in China only a few outstanding personalities whose names they can remember but who fail to fathom the stronger currents of mass movements, the rise of a generation accustomed to political thought and seeking some characteristically Chinese form of political action, which has not yet been found. Chiang Kai-shek's career commenced in 1923 when he was invited to become principal of the Whampoa Military Academy by Dr. Sun Yat-sen. He did not rise to even noticeable importance until after Dr. Sun's death in 1925. He has not been a factor long enough to leave a permanent impress upon the country. His military campaigns were won when the Russians advised him. His political victories were won when he was a big pea in a small pod in the city of Canton. His military failures began when the Russians left him ; his political failures commenced when he attempted to operate in the whole territory of China south of the Yangtze. His collapse came when the older and historically more important men in the Party sought a union of forces to which he was an impediment. The unification movement passed over him as a tank passes over dead stumps.

British Trade and Industry

By Gilbert C. Layton, Assistant Editor of "The Economist"

(Special to the "Far Eastern Review")

The Iron and Steel Industries

THE recently-published accounts of several large companies engaged in the "heavy industries" emphasise the difficult times through which the iron and steel trades in particular have just passed. For instance, the Ebbw Vale Steel, Iron & Coal Company, which has an issued capital of £3,700,000, returns a net loss of £415,526 for 1926-27. The meetings of the companies have also lately been held and the chairmen's speeches make anything but cheerful reading. They deal with the bad times that have just passed and of the intensity of foreign competition at the present time. Since 1920, said Lord Buckland, chairman of Guest, Keen & Nettlefolds, "iron and steel companies have fought a very stiff fight indeed, and it still continues." It is true that the early months of this year were more promising, but this appears to have been a temporary phase ; in the words of the chairman of the Ebbw Vale Company, there are "no immediate signs of the dawn." There are fears that the peak of production has been passed. Certainly the production figures for May give point to this contention, while the reports from the producing centres allude to the scarcity of new orders. Thus the immediate future provides no justification for optimism.

Yet if a somewhat longer view is taken there is not wanting ground for hopefulness. The price of steel is, relatively speaking, reasonable, being in this country only some 20 per cent. above the pre-war level. Steel, indeed, is competing with increasing success against wood, stone and brick. Owing to the war and post war difficulties many great schemes in which steel would play a big part have been held up and in many parts of the world these are now coming up for reconsideration. Viewing the world outlook, great steel-using plans in South America, Africa, Asia and parts of Europe are under discussion and when these mature the iron and steel industries will undoubtedly receive a much-needed stimulus. It should be the object of manufacturers in this country to raise their plants to such a state of efficiency that there will be no doubt regarding their ability to secure their fair share of this work.

The Coal Outlook

The British coal mining industry remains under a cloud. The situation has been further complicated by the decision of the French Government to prohibit imports of coal except under licence. The object of this move was, in the words of the responsible Minister, "to obviate the serious danger of social disturbances in our mining districts"—a danger due to the bad state of the French coal trade. At first, it will be recalled, there was a very drastic measure of protection, but, thanks in no small measure to the pressure of the French business community, this has since been modified. Licences have been granted to British exporters to the extent of 2,800,000 tons of coal for the months of June, July and August. Since our exports to France for the first three months of this year amounted to just over 2¼ million tons, it might appear that there is little ground for immediate concern. It is true that exporters are less disturbed than when the licensing scheme was first announced, but the fact remains that they would very much prefer the total abolition of the system. It was unfortunate, if only for psychological reasons, that this step was decided upon at much the same time that the resolutions of the Economic Conference were given to the world.

The French licensing system is a reminder—though a reminder is hardly necessary—of the unsatisfactory state of the international coal situation. The world, in fact, is suffering from a large surplus of production. For instance, the Belgian railways have announced a reduction of rates for coal in order to stimulate exports. In these circumstances, it is not surprising that the outlook for the British coal trade is far from encouraging. Output remains fairly high, but the recent substantial reductions in prices have not stimulated demand on the scale that was expected. Collieries continue to close down, for demand, both for home and export trade, is described as "singularly slow and lifeless." Clearly the British coal mining industry will have to make a very determined effort to improve its efficiency if it is to retain any considerable proportion of its business.

Britain as a Market for Machine Tools

In recent years the British engineering world has been increasingly, if slowly, adopting methods of mass production. This particularly applies to the motor car industry. It is therefore pertinent to inquire : has this development affected the British market for machine tools ? Glancing back at the pre-war years, though Britain had a considerable machine tool industry, America possessed almost a monopoly of a substantial machine tool import trade. Of imports in 1913 the United States was responsible for 89 per cent. of the tonnage and 90 per cent. value. In the meantime, however, the British industry has grown considerably and has increased its export trade. In 1920 exports amounted to no less than £3,000,000, but is now in the neighbourhood of £1,500,000. This movement has naturally had a material effect upon Britain as a market for machine tools. The outstanding fact is the extent to which America has lost ground, relatively speaking, as an exporter to Britain. Despite the general advance in production and the increasing tendency to mass production methods, America's exports of machine tools to Britain in 1926 show only a slight expansion as compared with 1913.

The explanation is, not that Britain is meeting her needs on a much larger scale than in pre-war days, but that a formidable rival has entered the field. This rival is Germany. Her progress may be measured by the fact that her percentage of tonnage of total imports in 1913 was only 2½ per cent., whereas in 1926 it reached the high proportion of 45 per cent. But the value does not disclose a corresponding increase and this suggests that Germany is concentrating on cheapness. She is, indeed, supreme as regards the simpler tools. On the other hand, American sales are becoming more and more specialised on the high-production type of machinery. Naturally America is somewhat concerned at her failure to make headway and is actively seeking the causes. It would seem that no small measure of Germany's success is due to the very generous credit terms which she is prepared to grant importers.

The Truth Must Win

THE American Chamber of Commerce at Shanghai, has, when the occasion warranted, expressed the point of view of the American business man in China. That view has been endorsed by the members of the Chamber, in the usual way, namely that in a contest between the Committee of the Chamber and Mr. J. B. Powell, who was in opposition to the Chamber, there was only one dissenting note.

The incident in question was unfortunate from every standpoint. To the average American, the disciplinary action against Mr. Powell, was regarded as an attempt to coerce press representatives to adopt the Chamber's view against their own judgment; Mr. Powell came to be regarded as something of a martyr who was being made to suffer because of his opposition to Great Britain. The real issue, namely, the protection of American life and property in China against Communist ravages, was utterly overlooked and disregarded.

It is therefore advisable, to complete the record, to publish in full, the official statement of the American Chamber's policy with regard to current conditions in China and the particular controversy which has received international attention:

Some members of the Chamber may possibly feel concern over editorials and articles which have appeared in newspapers both in America and locally in which this Chamber's attitude and policy with regard to China are grossly misrepresented. Among other things the Chamber is represented as being opposed to "a square deal for the Chinese" and as being opposed to American Government policy in China. The Chamber is also accused of being engaged in a long and expensive campaign for American intervention in China.

It is believed that most members of the Chamber understand thoroughly the circumstances under which this adverse criticism and misrepresentation has come about. Contrary to being opposed to its Government's policy the Chamber took occasion (as reported in the President's annual report) to express its approval of the administration's policy in sending marines and adequate naval protection to China for the defense of American life and property and also took occasion to express its disapproval of certain local subversive propaganda which was aiming criticism at defense measures adopted at Shanghai and was apparently encouraging Chinese factions to make unreasonable and untimely demands for surrender by foreigners (including Americans) of their present status in China and was endeavoring to influence American public and official opinion favorably toward a premature voluntary surrender of those rights and privileges.

As President Coolidge had given public expression to the fact that Americans are in China lawfully and as the Washington Government was rushing additional men-of-war and Marines to Shanghai, as a result of the attempted massacre of Americans and other foreigners in Nanking, for the purpose of protecting Americans concentrated at Shanghai and American property here, the Chamber felt justified at its Annual Meeting in taking action which would clearly dissociate it from such subversive propaganda.

It is believed that most of the members of the Chamber thoroughly understand and appreciate what the Chamber has been doing, as a full statement of all action taken by the Board of Directors up to the time of the annual meeting, on April 26, was distributed to the members present on that occasion in the form of the annual report of the President of the Chamber. A few additional copies are available in case any member has not seen it, and may be obtained from the Secretary.

The Board of Directors feels that it is scarcely necessary to refute or deny the reports and allegations above mentioned as they are so obviously without foundation but any member who may possibly be in doubt as to the policy pursued by the executive officers of the Chamber, by reading the annual report and consulting with the Secretary of the Chamber as to action taken since the date of same will be convinced that the Chamber has neither been engaged in "a long and expensive campaign for intervention," nor has it been opposed to its government's policy, nor is it against "a square deal for the Chinese."

As to selfishness, perhaps the Chamber may be rightly accused on this charge. If our recommendations as to a solution of the difficulties from which the Chinese people are suffering, to the end that their welfare may be assured and conditions be established favorable to the formation of a responsible government under which the Chinese people might prosper and thus become better customers for American products, can be classed as selfishness, then we shall have to admit ourselves guilty on this score.

The only public statement which the Chamber has issued on the China situation during the past year was one in which, along with a description of the chaotic conditions obtaining in China, the view was expressed that:

> "We are convinced that the *future welfare of the Chinese people* and the ultimate safety of American and other foreign residents throughout China, can be attained only through unified action by the Powers to suppress disorder and to restore conditions *favorable to the formation of a responsible government.*
>
> "We believe that immediate concerted action by the Powers to restore a condition of security for foreign lives and property in all Treaty Ports, and to recover all foreign properties which have been destroyed or confiscated, will have a far-reaching influence throughout China, to the *ultimate benefit of the Chinese people.* The result should not be difficult to attain with the naval forces now in Chinese waters.
>
> "In our opinion the future peace of the world and the general welfare of the Chinese people will be best served by the maintenance of the alignment of the Powers established under the Washington Treaties, and their co-operation in the service pledged to China during the Washington Conference."

This was released on April 2 to local representatives of American newspapers, as a public statement by the Chamber for cabling to the United States. It was issued just after the Nanking outrages of March 24 on Americans and other foreigners, and at a time when Shanghai was in the throes of a very trying and dangerous situation which was rapidly growing worse, and which threatened the safety of foreign lives and property in Shanghai.

It is believed that the wording of this sole public statement which the Chamber has made expressing itself in favor of armed intervention makes it quite clear that the Chamber is strongly in favor of a square deal for the Chinese people. That the Chinese people have so far failed to secure a square deal at the hands of their own political factions is apparent to those familiar with the situation obtaining in this country.

It must be left to the judgment of the individual members of the Chamber as to whether the views thus expressed were in opposition to the American Government's policy then obtaining. Helpful to forming an opinion as to whether the Chamber was in harmony with American official policy at that time is the fact that on Monday, April 11, nine days after the Chamber's public statement was issued, the Five Power note was presented to the Nationalist Government, in which the United States, Great Britain, Japan, France and Italy demanded punishment of the commanders of the troops responsible for the Nanking murders of foreigners, reparations for personal and material damage, and an apology in writing by General Chiang Kai-shek. The demands were accompanied by the following threat, which formed part of the text of the note:

> "Unless the Nationalist authorities demonstrate to the satisfaction of the interested Governments their intention to comply promptly with these terms, the said Governments will find themselves compelled to take such measures as they consider appropriate."

It is of interest to recall the salutary effect on the Chinese Nationalists of the threatened intervention, the purport of the note having been pretty generally understood publicly before its actual presentation, in that General Chiang Kai-shek, on April 12, the day following the presentation of this note, openly broke with the radicals and with the Hankow Government, and began cleaning the labor agitators and radicals out of Shanghai and Canton, thus relieving the tense and threatening situation and staving off foreign intervention.

It is believed that members of the Chamber need not be unduly concerned over the press reports above referred to which misrepresent the Chamber and its policies.

These adverse articles and editorials in the United States were a result of the editors being misled.

The executive officers of the Chamber feel that the truth in regard to this entire China situation must eventually win out as neither American public or official opinion can long continue to be misled by the propaganda and distortion of fact which has been carried on in the United States to subversive ends.

The China Trade

MR. Kenji Kodama, President of the Yokohama Bank each year in his annual address delivers a brilliant survey of business conditions throughout the world. His remarks with regard to China are always of particular importance because of Japan's rising pre-eminence in the China trade. Reference with regard to this trade in Mr. Kodama's address follow herewith :

Turning to China, momentous events occurred in that country during the half-year, of which at least two caused grave consequences to the country's economic circles. Of these two, one was the disturbances in the Central Provinces and the other, the great slump in silver. Disturbances in China appear now to be regular occurrences, as for the last fifteen years, which cover the period from the Revolution up to the present, there have been constant outbursts of disorder, now in the North and now in the South. The disturbances until recently may be classified as simply political in their character, occasioned by struggles for power between different war-lords or various cliques, but the one that spread over Central China during the past half-year was of a revolutionary character as well, and was also aimed against economic and social conditions. The sphere affected was very extensive, as not only were the Yangtze provinces involved, but several others as well. Consequently, nearly half of the country was in a state of war, which disturbed conditions generally, creating in turn constant unrest among the people, repeated occurrences of strikes of all sorts, a ceaseless menace to industries, and great disorder in communications and transportation, with consequent frequent stoppages in the movement of goods, all of which adverse factors as an inevitable result seriously hampered the country's foreign trade.

As the fall of about 20 per cent. in the price of silver took place in Autumn, when trade is usually in full swing, it ought in the ordinary course to have encouraged exports to be good, but realization of activity failed to materialize, owing to the adverse circumstances referred to, and as at the same time the fall in silver placed the import trade under a great disadvantage, the result was that the depression in both exports and imports became more in evidence.

Examining the condition of China's foreign trade during the half-year, raw silk, which is one of most important items of export, experienced dullness, as shipments from Shanghai, inclusive of Canton silk, amounted to only 66,985 piculs, or about a twenty per cent. decrease on the corresponding period of the previous year. The export of silk from Canton itself, even after the termination of the economic blockade against Hongkong, remained almost nil. Exports from Tsingtau of peanuts, the most important product of Shantung Province, were also very poor, but exports of beans and cotton from Tientisn showed good results, however, though wool and hides from the same port registered about a 30 per cent. decrease. Of the imports, cotton goods, the chief item, fared badly, as the over-stocks brought forward from the last term in the trade centres, such as Shanghai, Tsingtau and Tientsin, were still very heavy, with the result that enquiries for new goods were very dull, even in the season of demand in Autumn and onward. On the other hand, imports of cotton, due to bad domestic crop, greatly increased, while those of sugar were also good in the first three months, but declined heavily in the latter part of the period. Import transactions in rice, wheat and flour did not fare well, so that of both exports and imports for the half-year it may be said that they were in an indifferent state.

As regards money, the condition in Shanghai, to take that city as a representative example, although showing at times a stringent state when precautionary steps were taken in connection with enlargement of the disturbed area, was on the whole rather quiet, as indicated in the figures of the stock of silver held there, which amounted at the end of the half-year to 58 million Taels and 68 million Dollars, or increases of 14 million Taels and 4 million Dollars respectively as compared with the corresponding period last year. In regard to exchange, the rate on London at Shanghai, to take this exchange as an instance, following the fall in silver, trod a downward path, and was as low as 2s./4¾d. at the end, against 2s./11¾d. at the beginning of the half-year.

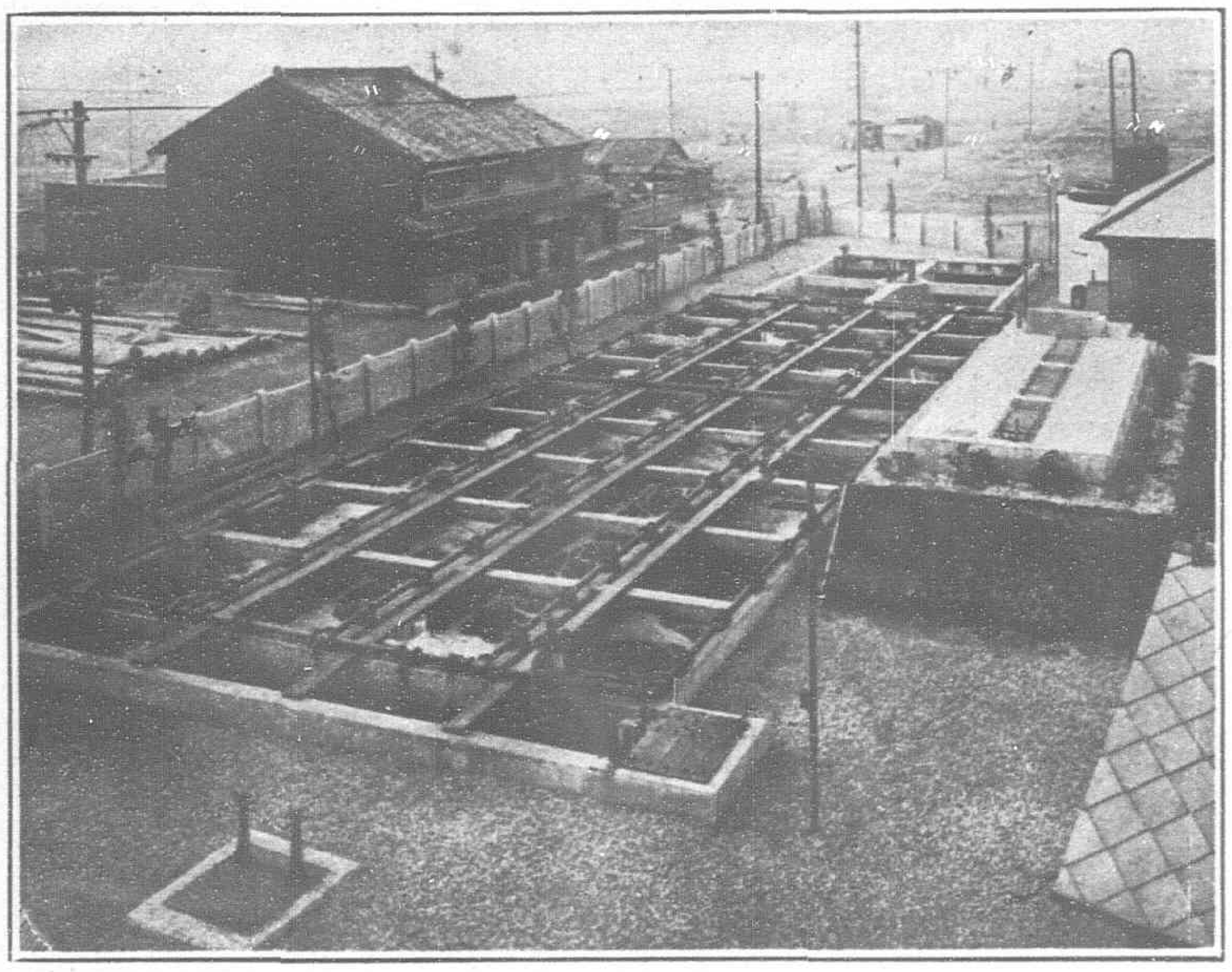
At Hongkong, the economic blockade by Canton, which had been in continuous operation for the last year and a half, was at last terminated in October, and, consequently, economic circles, which had been under a dark cloud in the past must have felt very much relieved. The Canton Labor Union insisted, however, on the continuance of the boycott against British goods, on the ground that the termination of the blockade and the boycott were different matters altogether. Moreover, the diffculties in connection with unloading at Canton goods shipped *via* Hongkong still remained unabated. Merchants at Canton also found that business *via* Hongkong was not necessarily essential for them after the calling-off of the blockade, as they had already got ample experience of dealing direct with the countries of origin of merchandise during the time of the blockade. The foreign trade of Hongkong could not, therefore be restored to its former state of prosperity, even after the termination of the blockade, and stocks of merchandise, such as Manchester goods, which had been carried from the time of the commencement of the blockade, still remaind unsalable. Trade conditions in Hongkong, consequently, were in an extremely indifferent state throughout the period under review.

In Manchuria, the harvests of agricultural products turned out badly as a whole, as the result of the drought which prevailed during the earlier part of the half-year. In addition, an unpleasant incident, the exclusion of gold notes, occurred in the Harbin district, while serious fluctuations in the value of Fengtien Notes took place in the Fengtien district, as the result of the over-issue of the notes on one hand and of artificial Government action to boost their value on the other, and the cumulative effect of these adverse factors was naturally, to hamper general business. The evil was, however, not confined to these factors only, as further trouble was caused when the Fengtien Government, with the object of raising war funds, started to corner Manchuria's most important product, beans. This Government action, totally depriving bean merchants of scope for their activities, compelled them to do nothing but fold their arms, and gave them a very serious blow. Business in the chief imported goods, such as cotton piece goods and yarns, flour and sugar, as the result of the fluctuations in Fengtien Notes, were also in a very bad plight, and unsatisfactory incidents, such as the non-fulfilment of contracts against imported goods and difficulties in the collection of the proceeds of sales occurred one after another, placing any sort of negotiation for imports in an absolutely hopeless position. Consequently, the economic world in Manchuria was in a very dull inactive state throughout the half-year.

Mr. Kenji Kodama

Osaka Sewage Plant

IN view of the fact that the waters of the rivers and canals in Osaka are polluted by sewage with the increase of the population and factories, the Municipal authorities of Osaka have come to realize the necessity of constructing tanks to clean sewage, and has built them by way of experiment at Ichioka, a factory quarter at the mouth of the Shirinashi River in the southern part of the city.



Ichioka Disposal Plant

The operation of cleaning sewage by means of the activated sludge process was recently started, with highly satisfactory results. According to the process, all organic matter in sewage is removed by oxydization The Osaka Municipality is going to build many more tanks of the sort.

The tanks disposes of sewage of the district of about 205 acres at Ichioka, which has the population of about 26,000. The construction of the tanks cost Y.111,000, representing Y.4.23 per capita of the population of the district, excluding the price of 500 *tsubo* of land used for the tanks. The working expense of the tanks is about Y.20,000 a year, the per capita cost being about 77 *sen* a year.

The quantity of sewage disposed of is about 171,600 cubic feet, and the tanks are capable of purifying 2 cub. ft. of sewage per second. The arrangements consist of a sink, where muddy substances are settled and floating substances are filtered and removed, a mixing tank, which is 5 feet deep, 4 feet wide and 35 feet long, exposure tanks capable of taking in about 28,000 cub. ft. of sewage, settling tanks, which take in sewage from the exposure tanks, mud tanks, pumps, air compressors, air pipes, an engine room, etc.

A special tank is provided for taking in excrements. At present there are no sewers of the European type, which take in excrements. Sewers in Osaka are mainly for sewage discharged from kitchens and factories. But inasmuch as the water-closets of the flusher system are gradually increasing, and sewers of the European Type will be constructed before long, the sewage tanks constructed at Ichioka are working on sewage with excrements specially mixed in it for experiment.

Two centrifugal pumps of 10 h.p. are installed for sending sewage from the sink to the mixing tanks, and two centrifugal pumps of 3 h.p. for sending the content of the settling tanks to the mud tanks. Two air compressors of 49 h.p. of German make are each capable of sending 750 cub. ft. of air per minute. The filtros plates used are of American make.

The muddy substances left after sewage is purified total about 1,700 cub. ft. a day. They may be used as fertiliser, but at present they are discharged in the sea. The tanks of the similar system exist in Nagoya and Amagasaki, near Osaka, but they are on smaller scale than those of Osaka.

Procedure for the Provisional Registration of Patent Applications in China

Translated By N. F. Allman

The Ministry of Agriculture and Commerce
Notice No. 1. June 8, 1927

WHEREAS this Ministry has received numerous applications from foreigners for the registration of Patents which could not be attended to due to the non-promulgation of a patent law governing such cases. Recently applications from foreigners have increased. Therefore the following provisional patent procedure is hereby promulgated in respect of foreign Patents :

Article 1.—Any treaty power citizen who has a patent from his own government, or from another government, for an invention, discovery, or new method in the arts and industries may, during the validity of said patent, and pending the promulgation of a patent law in China, apply to this Ministry for provisional registration, subject however to the requirements of any formal Chinese patent law hereinafter promulgated. Applications concerning drinks, foods, medicines, military supplies and contraband articles will not be registered.

Article 2.—Applications must be submitted on the forms provided by this Ministry and must be clearly written. Applications must be accompanied by a copy in a foreign language for reference purposes.

Article 3.—For reference purposes the applicant must also submit the patent certificate or other document or a copy thereof issued by a patent office together with drawings, and specifications, and a printed detailed statement. If the application is filed by an agent a Power of Attorney must be submitted.

Article 4.—After an application concerning an article or method is registered and approved by this Ministry a receipt shall be issued. This shall not, however, be deemed a grant of registered patent rights, but such cases shall be given prior consideration when a formal patent law is promulgated.

Article 5.—The applicant shall pay an application fee of $2.00 for each article in the application and a registration fee of $12.00. The registration fee shall be returned if the application is rejected.

A Correction

In our April issue, on page 33, appeared the advertisement of Fairbanks, Morse & Co. illustrating their Railway Equipment.

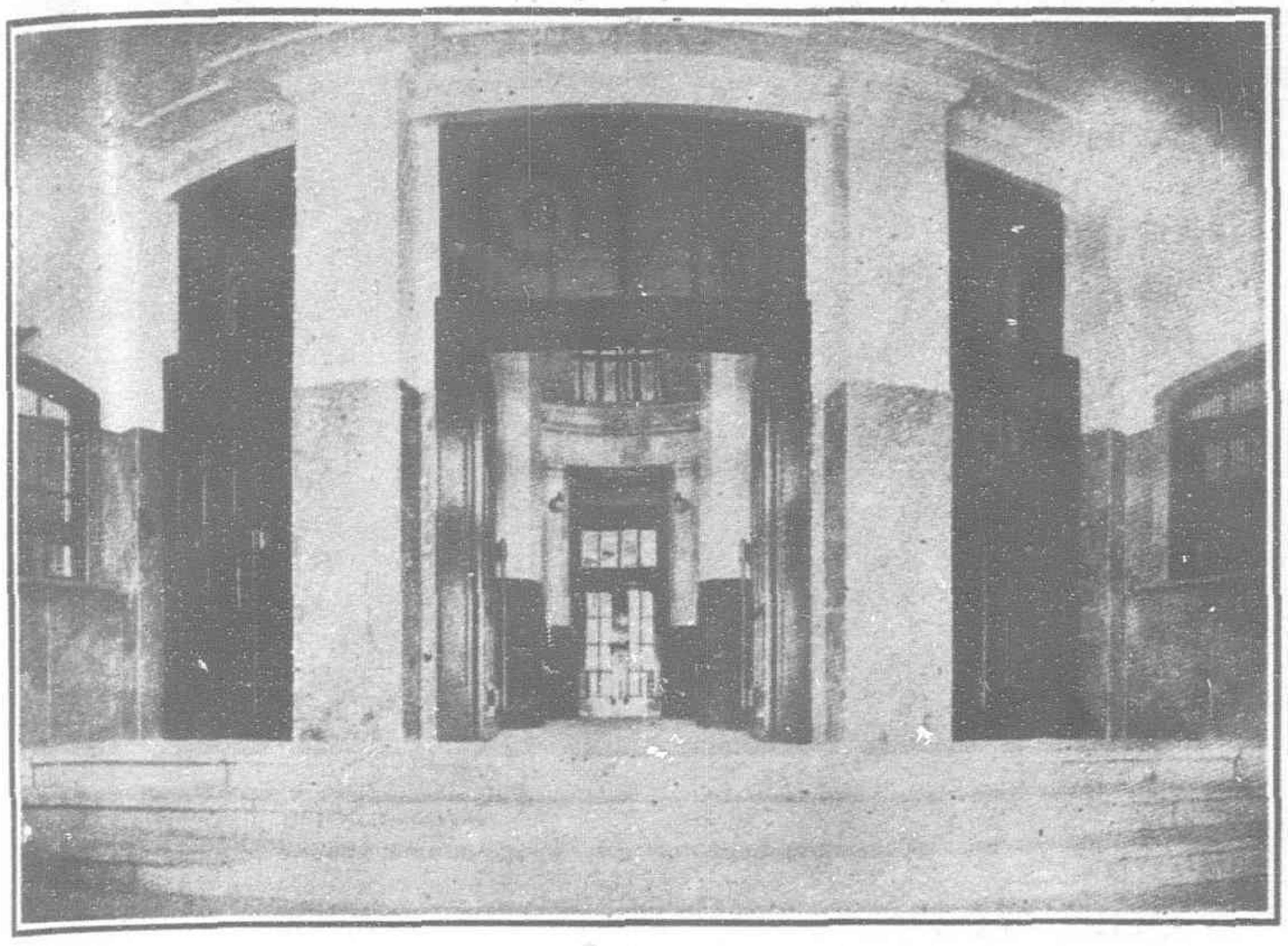
There was an omission in the first paragraph of this advertisement. The Fairbanks, Morse & Co. make three types of Water Cranes, whereas only two were described. The following are the three types of Water Cranes which they make :

No. 6 Flexible Spout, sizes 6, 8 and 10-in.
No. 7 Rigid Spout 6, 8, 10 and 12-in.
No. 12 Telescopic Spout, 10 and 12-in.

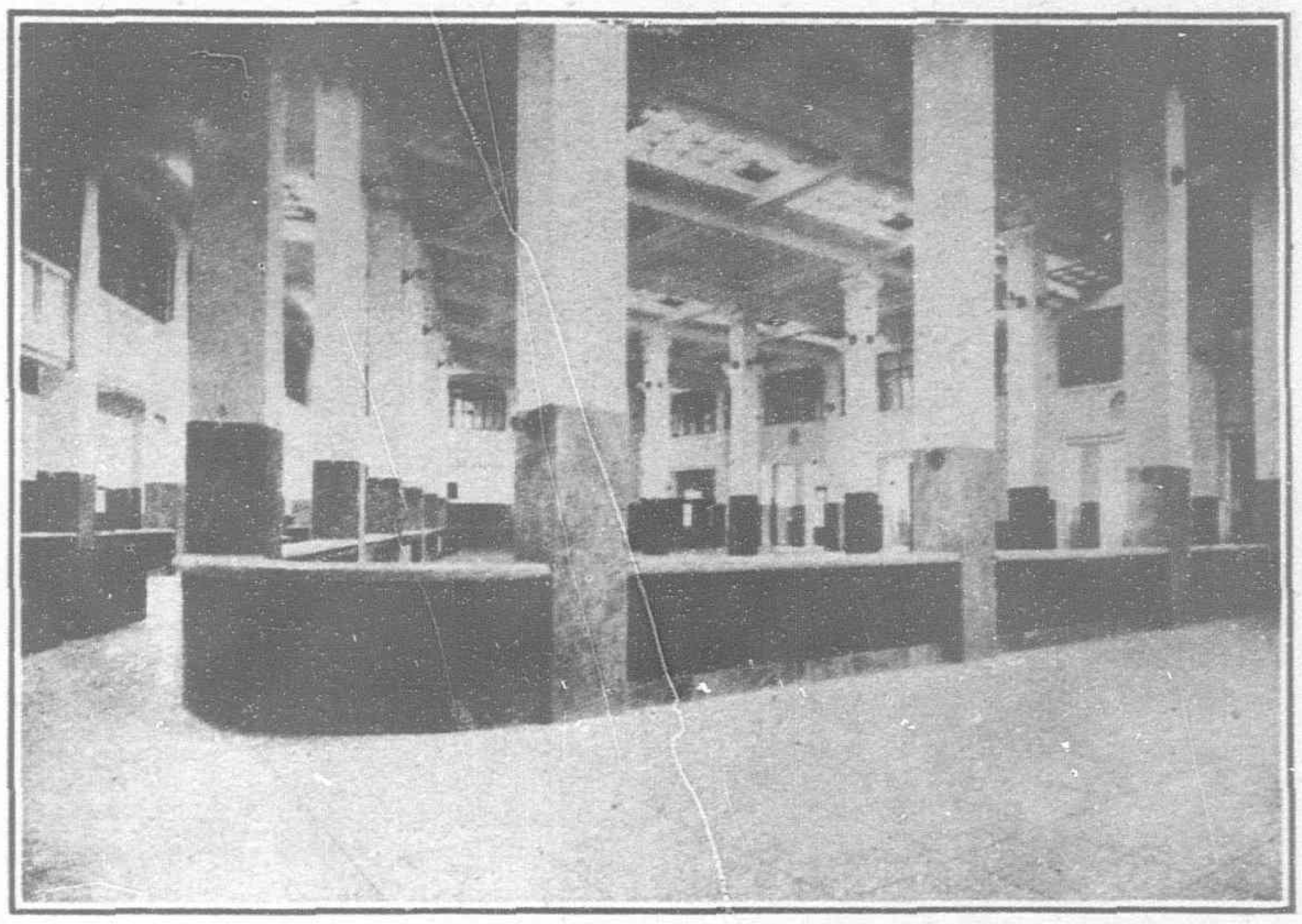
The local office of Fairbanks, Morse & Co.

Central China Commercial Co., Shanghai
Shewan, Tomes & Co., Hongkong,

will be pleased to answer any questions regarding their equipment.



Front Entrance of the New Building of the Kobe Customs Office



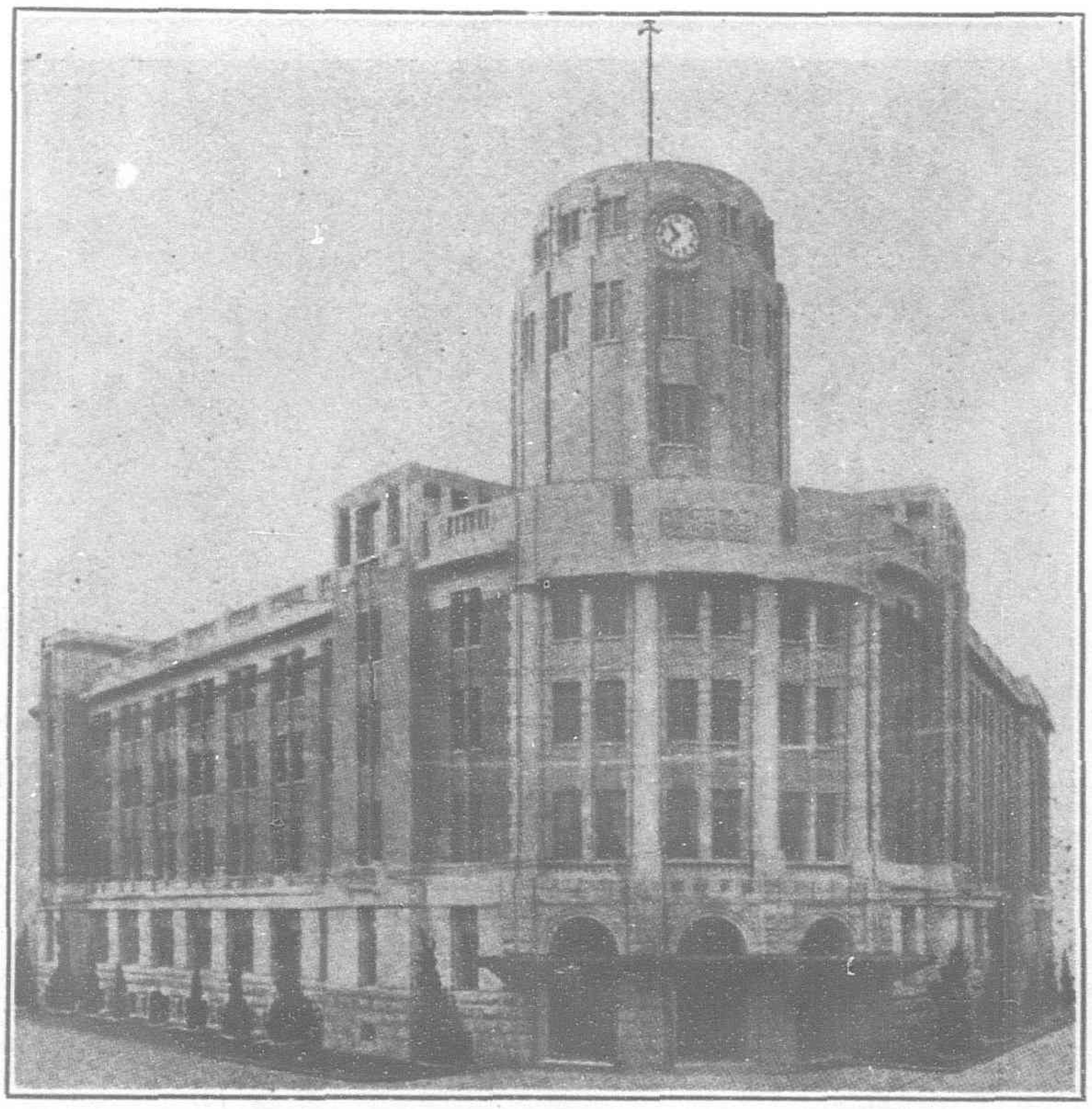
Office on the Ground Floor

The New Kobe Customs House

ADDED to pride of the Kobe harbor is the new building of the customs office, the construction of which was commenced at an estimated cost of Y.1,150,000 on April 14, 1923, and was completed on Mar. 31, 1927, at 6 chome, Kano-machi, Kobe city. The site of the new building extends to a little more than one acre; its building area is slightly above one-half of an acre. It is an eight storied, reinforced concrete building, and the extended floor space, including the basement amount to nearly 2½ acres.

The building stands on 919 seventeen-feet piles which were concreted at nine feet below the surface of the ground. The entire frame work is made of the reinforced-concrete so that the building may withstand severe earthquake.

The office floor is covered with linoleum made by the Toyo Linoleum Manufacturing Company, but the corridor of the ground and the second flour is covered with special stone. The floor of the analysis room and the freight examining room is of asphalt-concrete.



Front View of the New Customs Office Building

Heating System

The side-walls and ceilings of ordinary office rooms are painted with cement plaster, although special rooms, including the rooms for distinguished personages, are painted with high grade paint, and parts of these rooms are covered with English and Canadian wall-paper.

As regards heating, direct heating system with low pressure vacuum steam heater is adopted; in the boiler room of the basement, there are three sectional type boilers, from which the steam is sent to all parts of the building, and the condensed water automatically returns to the boilers by operation of a vacuum pump.

The hall of the ground floor is heated, in addition to the steam heater, with purified hot-air which is produced and sent from the basement by a blower of which the capacity is 2,000 cubic feet per second.

As for fire-fighting, the fire-fighting pump of the basement is connected with the Municipal water main; this pump is provided with three tubes in such a manner that each flour has three different fire-fighting hydrants, and the extreme end of these tubes are connected with the reservoir on the roof. As soon as any one of these fire-fighting hydrants is opened, it automatically puts into operation the pump which is of high-pressure turbin pump, and simultaneously, an electric signal is given.

This building is provided with three elevators. The one at the front entrance of the building can carry 14 passengers at one time, at the speed of 150 feet per second. There is another one of the same capacity at the western side of the building; this elevator, in case of necessity, can carry freight of not heavier than 3,500 lbs. The remaining elevator which is connected with the tower house on the roof of the building can carry 8 passengers at one time at the speed of 120 feet per second.

Each one of these elevators has iron door at the entrance of every floor for the purpose of fireproof; it is automatically opened and closed by the door-closer.

In addition to the foregoing three elevators, there is one exclusively used for carrying crockery. One feature of this elevator is that it is provided with a brass communication-tube by means of which conversation may be exchanged between any floor.

In regard to the gas supply, the gas main is connected by a branch tube with the boiler room, and through a metre, the minor tubes are led to the cocking room on the third floor, to the analysis room, and tea making places of each floor.

Electric Equipment

The Kobe customs office is furnished with electric power, (alternative current, cycle 60, and 2,200 volts, 100 k.w.) by the Kobe Municipal electric bureau, and through the customs office's own transformer station is supplied, requisite power for lighting and operating machinery equipement.

The electric power supply room of the new building, which is located in the basement just under the front entrance, is comprised of one switchboard for lighting and electric power trunk line, two switchboards for lighting, two switchboards for power supply, and another switchboard for charging battery, a motor generator for charging battery, and another generator for telephone and telegraphic operation.

The lighting equipment is entirely furnished by the Tokyo Denki K.K. or the Electric Tokyo Company, Ltd.

On the roof of the new customs office building is an electric siren, which is operated by a $\frac{1}{4}$ h.p. motor; it is connected with a switch fixed at the front entrance, and by operation of which, time is reported.

Takao Electric Cable-Car Line

NOT far from the Tama Mausoleum is Mount Takao (1,968-ft.), a popular resort noted for its maple trees. By railway, it is two hours from Iidamachi Station, Tokyo to Asakawa, the first station beyond Hachioji, whence motorbuses are available to Kiyotaki at the foot of the mountain. On the top of the mountain are the Buddhist temple, Yakuo-in and associated buildings, erected between 729-748. There is a splendid view from the top.

In order to give facilities for the excurtionists, a plan for constructing an electric cable-car line was carried out by Takao Cable-Car Company, Ltd., who started the work in January, 1925. The construction was completed in January last and its actual services have been Opened in the latter part of the month. The Company authorities had estimated that the number of excurtionists who would utilize the rope tramway will be in the neighborhood of 300,000 a year, and 2,000 per day in the busiest season, spring and autumn. However, far ahead of expectations, the line is actually carrying passengers from 7,000 to 10,000 in number daily, since the operation was started. In view of the favorable conditions, therefore, they contemplate to cover the line in seven minutes instead of 11 minutes, at which rate the cars are running at the present moment, so that the cars, two in number, can make a trip more than one hundred times each per day.

Outline of the Equipments:

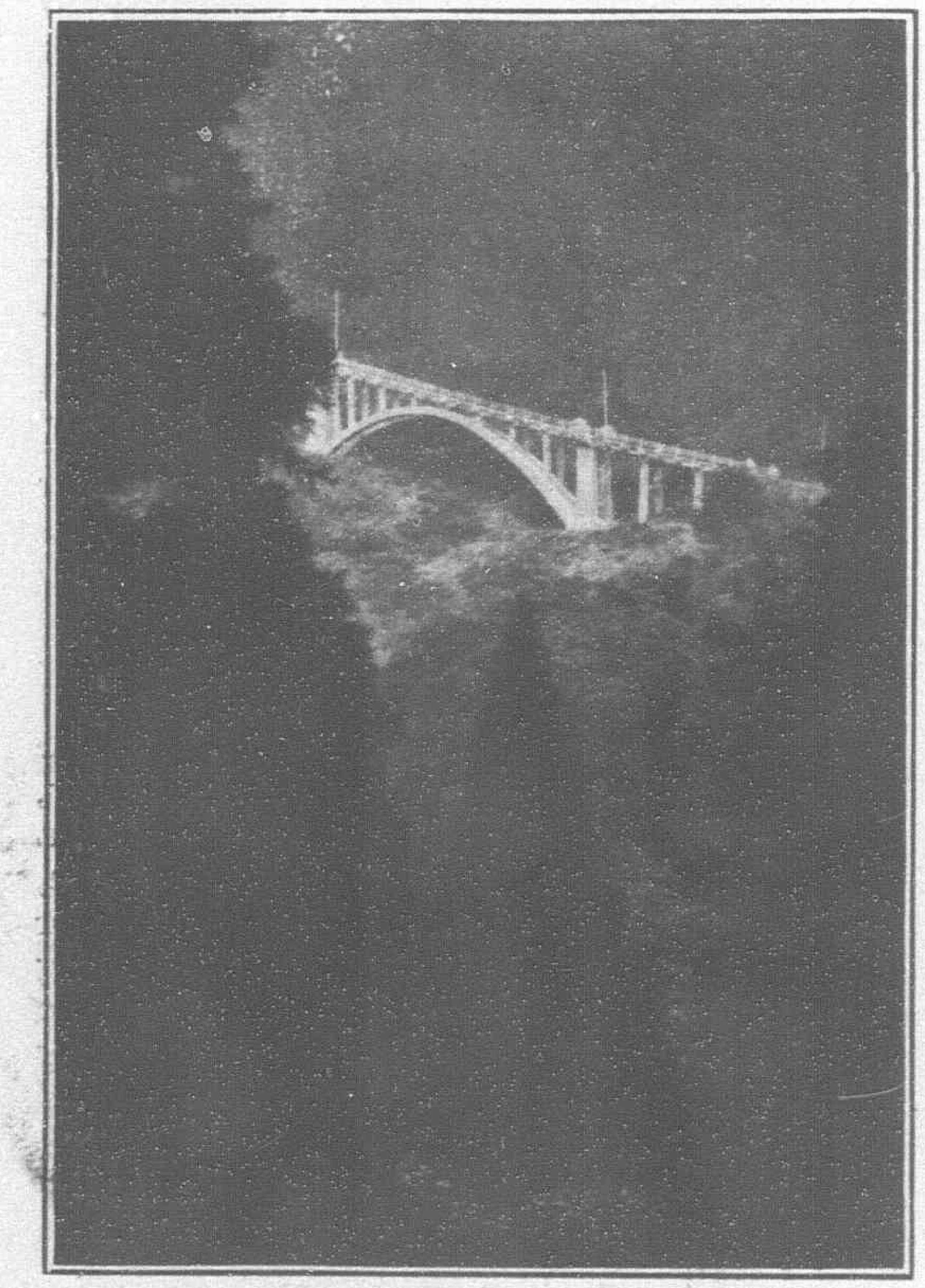
Track: The length of the track is 1,020 meters, while its level distance is 975 meters. The terminus on the top stand at a height of 271 meters over the starting point at the foot. The maximum grade is $\frac{1}{1.65}$, and minimum, $\frac{1}{9.5}$, its average grade being $\frac{1}{3.6}$. There is an intermediate station, Biwataki between the starting point, Kiyotaki and the terminus, Takao-san. The track is of 60 lbs. The gauge is 3 feet 6 inches.

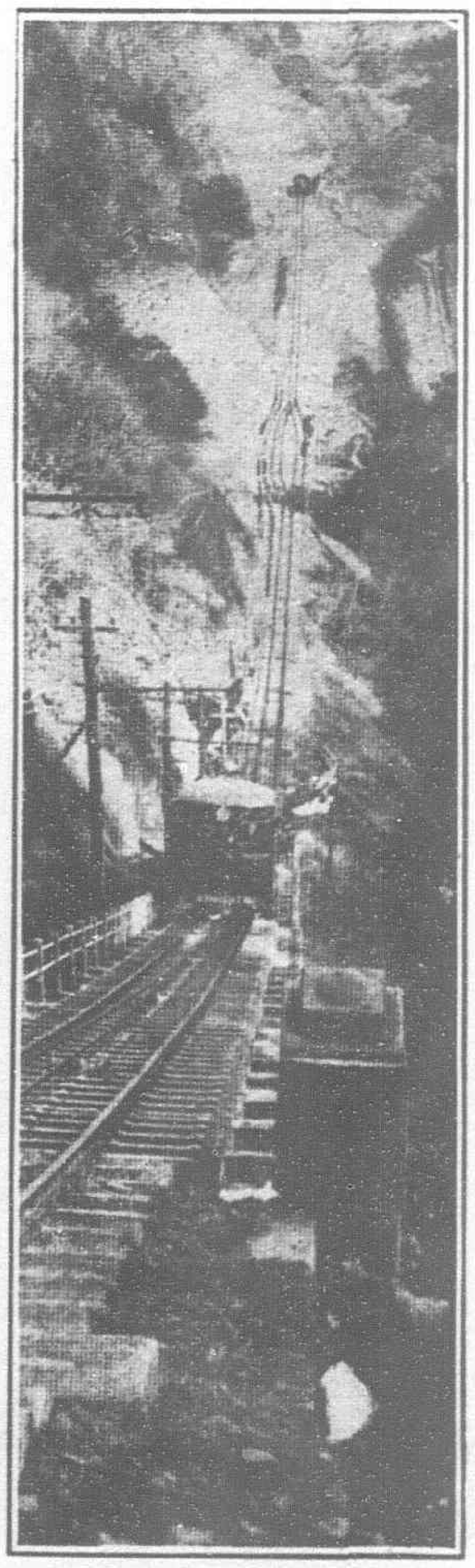
Car: There are two cars in operation each equipped with four wheels. The cars are alternately to run in the opposite directions. Each car has an accommodation for 50 passengers. The time required for making a trip from the starting point to the terminus is 11 minutes.

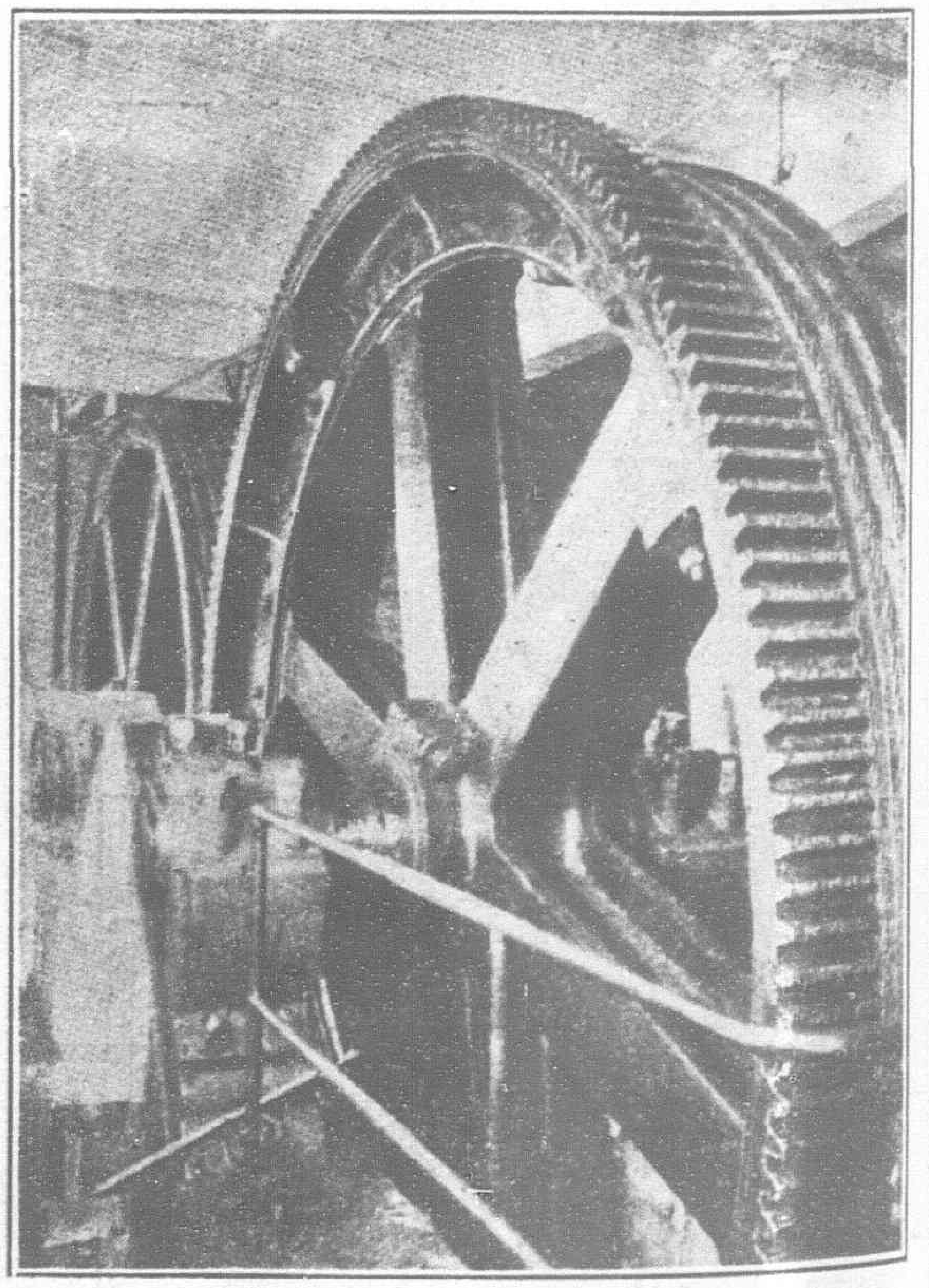
Winder: Driven by a 3,000 V, 50—, 125 H.P. three phase induction motor, a winder of spur gear system operates a main rope wheel with a diameter of 3.66 meters. The electric power is supplied from Hachioji Sub-station of the Tokyo Electric Light Company.

Cable: The diameter of the cable is 3.18 centimeters. The cable has a breaking stress of about 76,000 kilo.

Brakes: Each car is provided with an automatic brake, a foot brake and a hand brake. An emergency automatic brake is equipped with the winder.


The Myoon Bridge on which the Rope Tramway Passes


Takao Cable-car in Operation

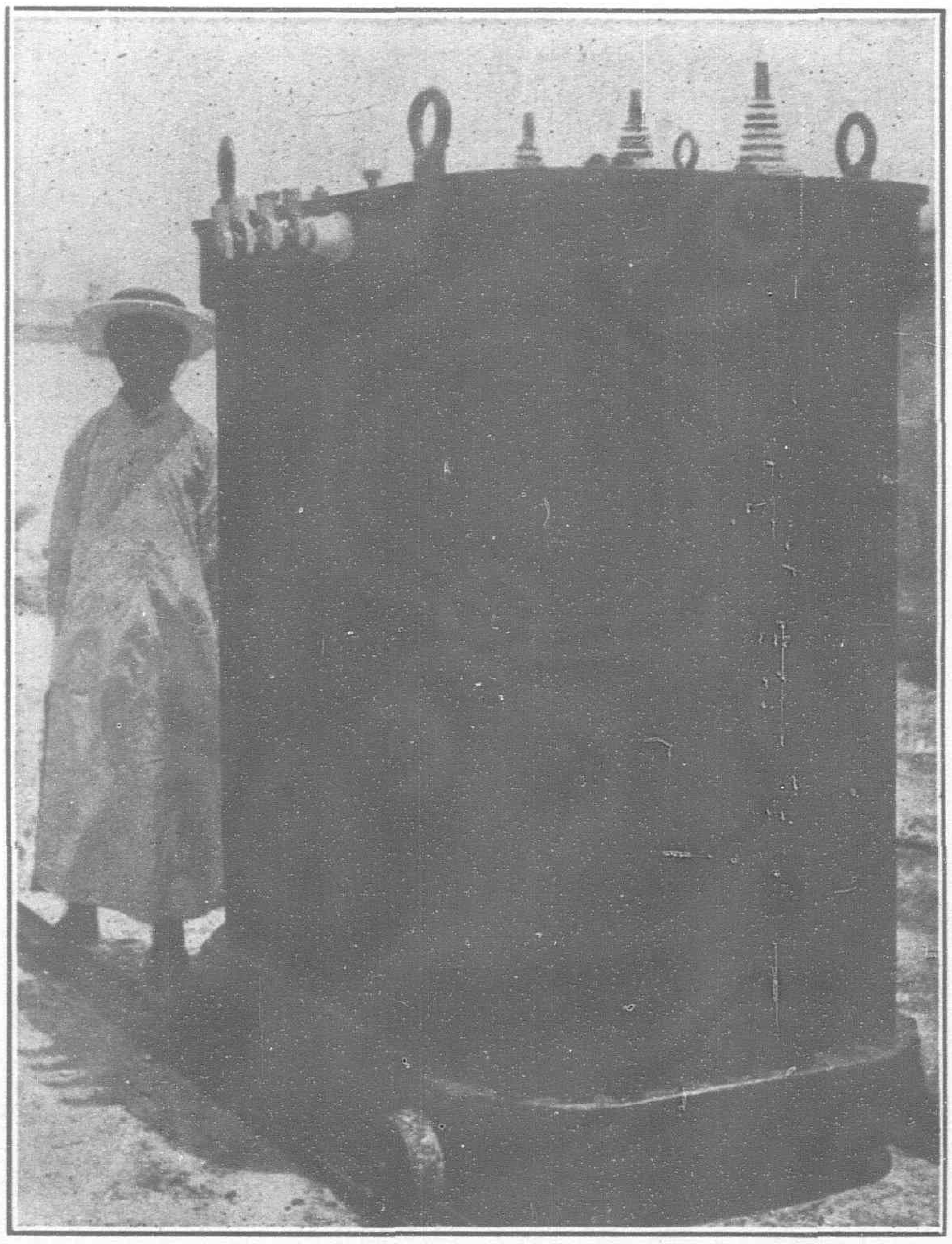

Main Cable Wheel for Takao Cable-car Line

"Made in China"

Infant Electrical Manufacturing Industry Growing Rapidly in Shanghai

THE term used as the title for this article probably rarely has been applied in trade, but at the rate of progress at present shown in one infant indigenous industry in China, and, be it said, with the growth of the nationalistic spirit, it will not be long before products bearing this stamp will be in common use not only in China, but in many countries as outside.

In Shanghai, the only city in this broad land where industries are able to develop, a small group of manufacturers of electrical machinery and devices of every description has been slowly struggling to stability during the last few years until to-day there is a definite industry established, on a small scale, to be sure, but with every possibility of expanding to untold proportions. The total capital represented is not more than $5,000,000, but all the firms that have survived the last few years of turmoil are on a paying basis and constantly adding to their output.


One of the Large Transformers "Made in China"

"Made in China" means not only that the article is produced in this country, but that it is produced usually at between 25 and 40 per cent. less than the cost of the corresponding article in the United States. That difference in production cost is the basis for the surprising development that has taken place here of recent years, based in turn, of course, upon the low cost of labor and other factors. To a certain extent, this industry will be hampered by the new tax schedule of the Nationalist Government, which in the rates going into effect on September 1, has placed a heavy excise on all factories. Besides, the increased duty on imported material will make it more difficult to compete with the foreign product.

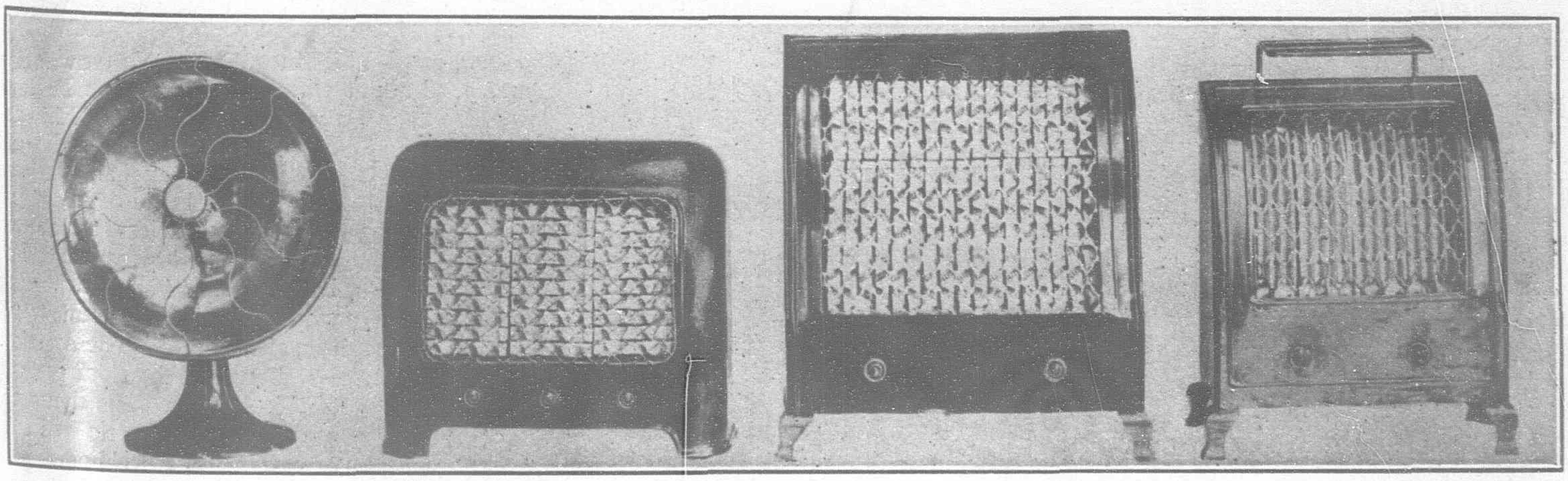
In going over the list of the products turned out by the various factories, it is amazing to note the number of articles which this small industry already has contributed, almost wholly through the efforts of Chinese engineers. All the ordinary electrical devices of the West have been duplicated here, even to electric motors, and practically the only machinery which is used extensively in the electrical industry that are still exclusively imported from the West are the larger dynamos.

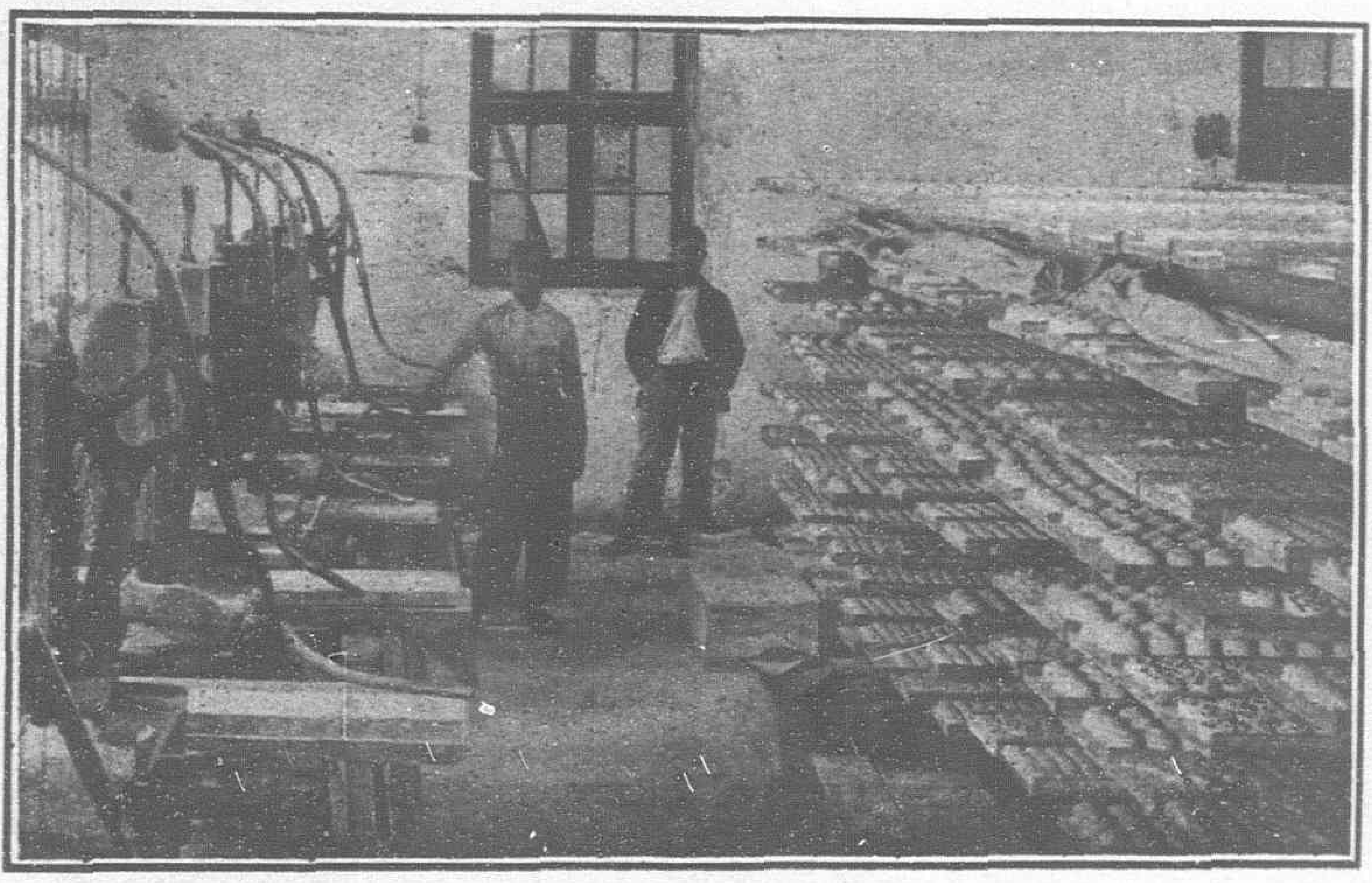
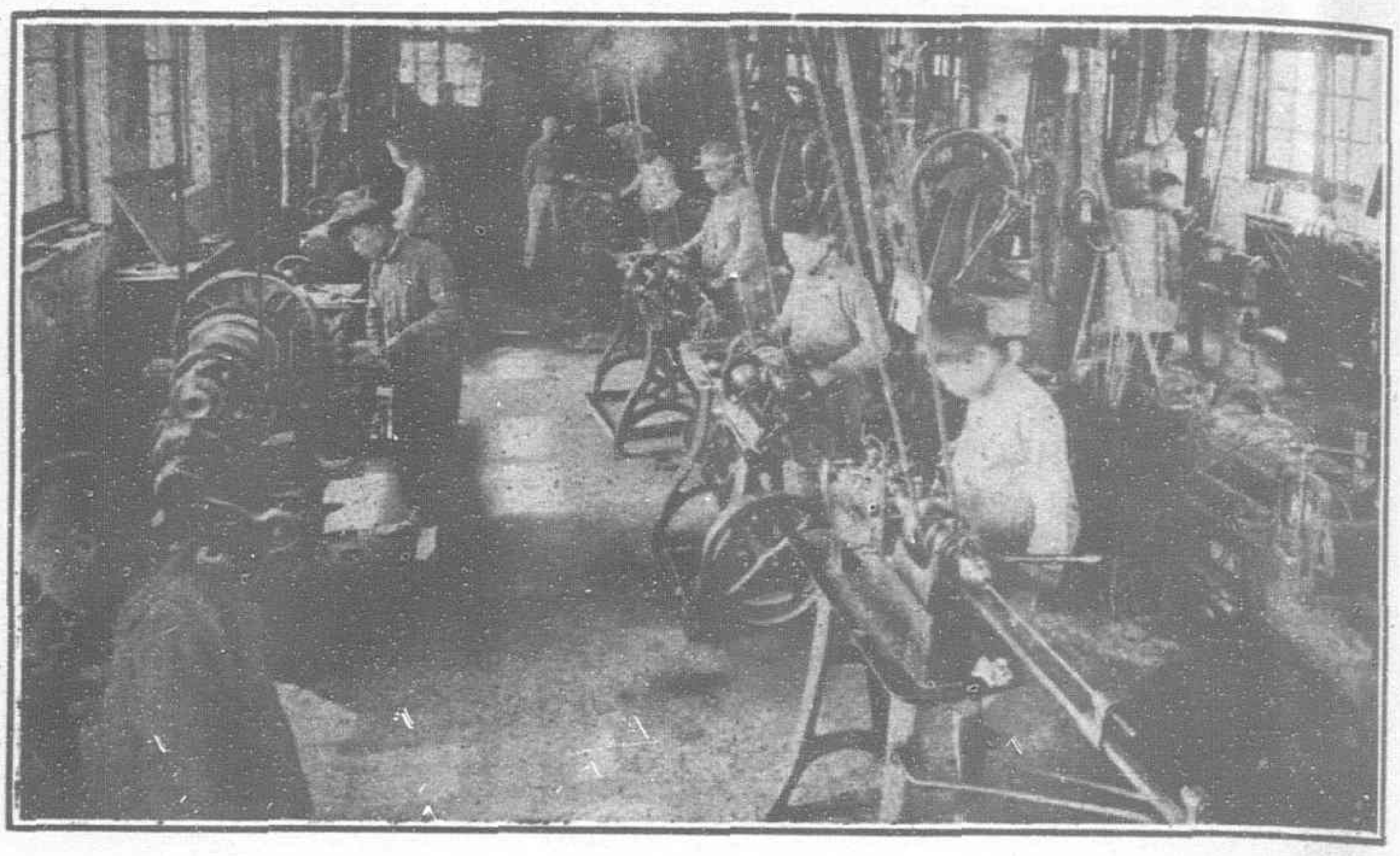
Fans, heaters, every sort of fixture, switch and insulator, radio apparatus and other delicate instruments, transformers and motors, incandescent lamps and other household applicances are included in the list, and in many cases there is a distinct tendency to suit the goods produced to the peculiar demands of the Chinese market, something which none of the foreign firms have yet attempted, and to engage to a limited extent in export trade.

While the factory producing the greatest bulk of commodities of this class is foreign-owned, the China General Edison Company, discussed in detail in the July issue of the "Far Eastern Review," this plant has specialized in two commodities —porcelain and electric lamps —and two other factories, owned and managed entirely by Chinese, are operating on nearly as large a scale, and there are half a dozen smaller Chinese shops, established within the past year or so, that are gaining a foothold in the business by slow degrees.

The Chinese Factories

One of the Chinese factories referred to was in the field ahead of the American-owned Edison Company. The Wahson Company, producing chiefly fans and other devices. This


Some Electric Heating Devices Produced in a Shanghai Factory

At Work in the China National Engineers and Manufacturing Co. in Pootung

and the Chinese National Engineering and Manufacturing Company, Ltd., founded six years ago and covering a more extended scale in its products, and each of them representing an investment of about half a million dollars, are the two leading Chinese firms, both of them established at the outset on a tiny scale.

The next largest shop in Shanghai, perhaps, is the China Scientific Instrument Company, specializing in radio sets and general electrical apparatus. In addition, there are several smaller plants, one of them a Chinese shop producing electric lamps, which are struggling to gain stability in the trade. Several other enterprises, started during the past three or four years, two of them with foreign capital, have failed or withdrawn owing to the temporary depression in the market and to too rapid a program for expansion.

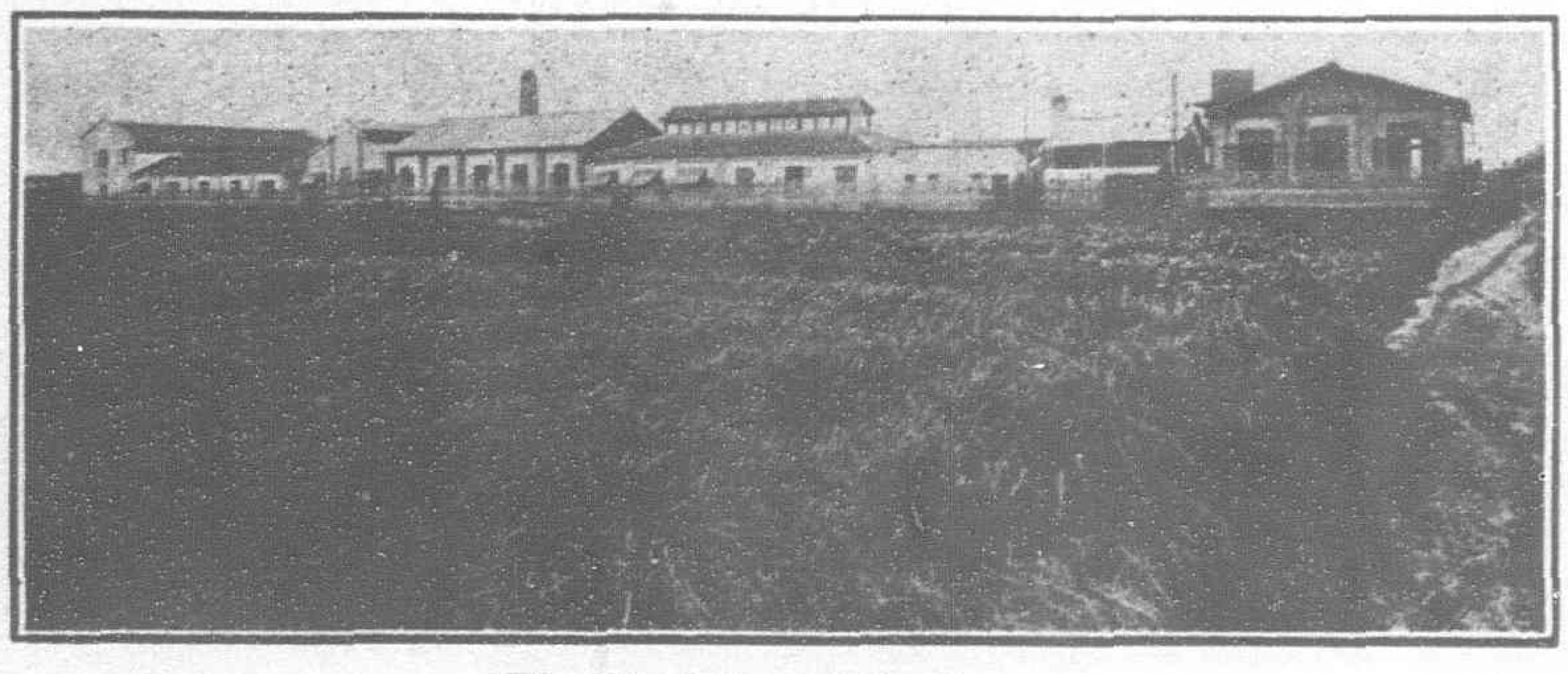
But the Wahson and the Chinese National Engineers and Manufacturing Company plant, operated by men skilled not only in the technical phases of production, but in modern methods of factory management, have withstood all momentary setbacks and have shown steady gains year by year.

Launching its business in 1921 with a capital of $100,000, a small factory and about 50 employes, the Chinese National has since expanded to a large and well-equipped factory employing 300 workers, both men and women and handling more than $1,000,000 worth of business annually. It is in this plant that the widest range of products is manufactured, falling under three general classifications:

1. Electrical machinery.
2. Lighting fixtures.
3. Household appliances.

In the first group are included transformers up to 400 k.v.a. and 6,000-600 volts, two of this size having been furnished for the Chinese Tramways and the Pootung Lighting Company in Pootung, where the factory is, across the Whangpoo river from Shanghai. Small transformers for use in the interior are turned out in large number. The motors turned out by the plant have also found a place on the market, being from 3 to 15 h.p. induction motors. The transformers are between 30 and 40 per cent. cheaper than imported ones and the motors about the same prices as foreign-made products.

In the second group are almost a complete line of fixtures, both for wall and ceiling, fuse cutouts and switches of every kind. This latter product was formerly imported almost entirely from Japan, but the Chinese National has been competing successfully with the foreign product during the last four or five years. The porcelain articles turned out here are of a cheaper quality than those developed at the China General Edison Company, which are principally for export and find a different market. A small export trade in these sockets and switches and in the lighting fixtures has been built up with the Philippines.



The Factory at Pootung

For Chinese Custom

In the third and largest group of products are irons, chafing dishes, electric grills and heaters. The flat-irons are about 30 per cent. cheaper than imported articles and have found an extensive sale. But the most interesting development in connection with this infant industry has taken place in the production of heaters of a reflector type, suited specially for the Chinese, who, eschewing the heater which warms only their feet, prefer one that warms their faces and hands. This small reflector heater, which can be placed on a table for this purpose, has therefore proved very popular with the native consumer, although heaters of foreign design for the use of foreigners in China and returned students are also produced here.

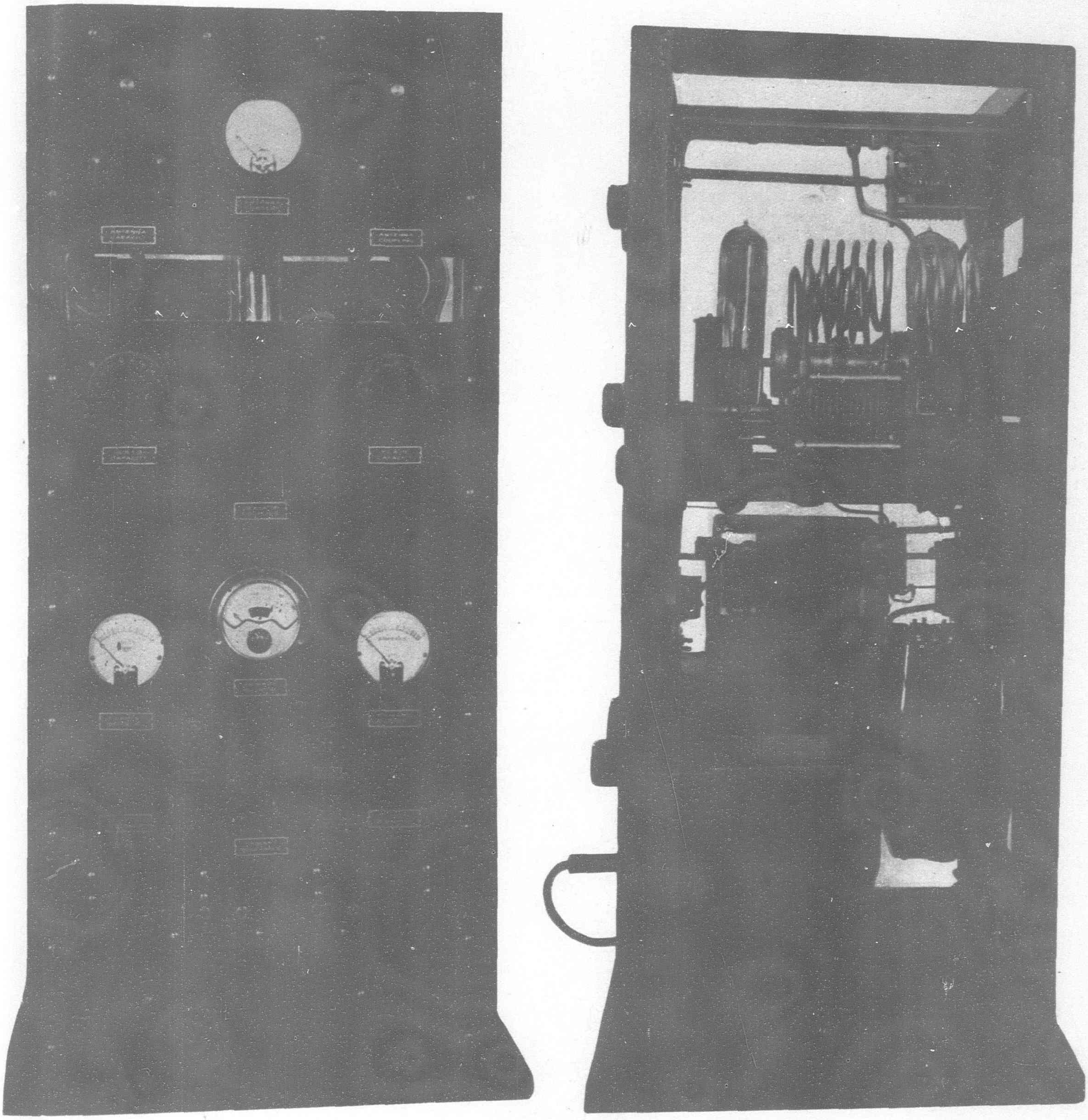
On a par with the heater for local uses, is the chafing dish, which again is designed to suit a peculiar custom of the country. The Chinese, instead of merely cooking their food in winter, are in the habit of just warming it, and a chafing dish has been produced specially for this purpose which is expected to become as popular as the thermos bottle and serve pretty much the same ends. The trade name for this special electric "warmer" is "Hot Instant." A small number of fans have been produced in an experimental way in this factory. All the goods are guaranteed for a year, with free repairs.

Returned students from America are responsible for the success of this plant, which is headed by Mr. Yang, a graduate of the Case School of Applied Science in Cleveland, Ohio, who served for a time with the Westinghouse Electric Company and two other electrical engineers, S. K. Lau, and George Chow, both graduates of Pittsburgh University trained likewise at Westinghouse plants in America.

A modified American system has been adopted in the factory, where the nine-hour day is the rule and the mechanics make as high as $1.50 a day. There is seldom any night work and the factory is closed on Sunday. The girls employed in the porcelain plant receive from 20 to 60 cents a day, which is higher pay than the average, only the apprentices receiving the bottom wage. There is no labor compradore in this factory, as in the China General Edison Company plant, and all the employes are paid directly.

The Wahson factory, established in 1915, the outgrowth of a cloth machinery foundry, is about the same size as the Pootung plant of the Chinese National but is located in the industrial district of Shanghai, and has gone farther in the development of the more intricate apparatus. It is headed by two men, Mr. Yih and Mr. Yang, neither of whom have had academic training, either in China or America.

Fans are the chief product of this factory, while dynamos, generators, electric irons, transformers, switchboards and electric heaters constitute the



The 100-watt Short-wave Transmitter Made in Shanghai

bulk of the remainder of its output. Most of the material used is imported from the United States.

The pride of the establishment, besides the fans, are the generators, which are three-phase alternating current type, with regulator pulley and slide rails, 1 to 20 k.v.a., 200 to 3,000 Volts, 1,000 r.p.m., and 50 cycle. The transformers are single phase 600-6,000 volts, 1-100 k.v.a., and three-phase, 600-6,000 volts 3,500 k.v.a. The dynamos are small, being direct current coupled direct with steam-engine 100 volts, 5 to 62 k.w., and plating dynamos of 6 volts 60-300 amperes.

The electric irons are 300-600 watts, electric frames 400-600 watts, radiators 600-3,000 watts, and in addition to these articles there are electric pots, ammeters, voltmeters, oil circuit breaks, and current limiters.

In describing the growth of the plant, Mr. Yih declared that although the large factory now in use supplanted a small shop nine years ago, the greatest growth in the business has been experienced during the past four years, when they first embarked upon the manufacture of electric fans, at considerably less than the price of the imported article. The products generally average a reduction of about 20 per cent. under the foreign goods.

In Special Field

At the third Chinese shop where electrical goods are manufactured, there was an entirely different situation, this company developing in still another distinct field, and being in an even younger evolution. The China Scientific Instrument Company, two years old, operating in a small workshop in downtown Shanghai on Museum Road, but planning soon to move to a factory of its own, is engaged in producing radio and laboratory apparatus of a highly specialized nature and general electrical goods, such as small motors,

Another View of the Pootung Factory—Testing Room

lighting fixtures, and switches. It started with a capital of only $15,000, which has since been increased to $200,000. In response to a constantly expanding market, a business of $300,000 was done during the year 1926, with an equal amount done during the first half of the current year. From a small office two years ago, with only two men, the company now occupies most of the ground floor, and employs 200 men.

At the head of the company is Mr. Ting, a graduate of Nanking University, with post-graduate training at the University of Chicago and experience with Bausch and Lomb. He personally supervises the work on delicate electrical measuring instruments, physical instruments, and repair work on such apparatus of foreign origin. The only foreigner in the company is Mr. Rawls, an American radio engineer formerly connected with the General Electric Company, who directs operations in the manufacture of wireless receiving and transmitting sets. Parts for the powerful Government radio station at Nanking were turned out in this shop, which is likewise competing with imported radio apparatus of smaller sizes.

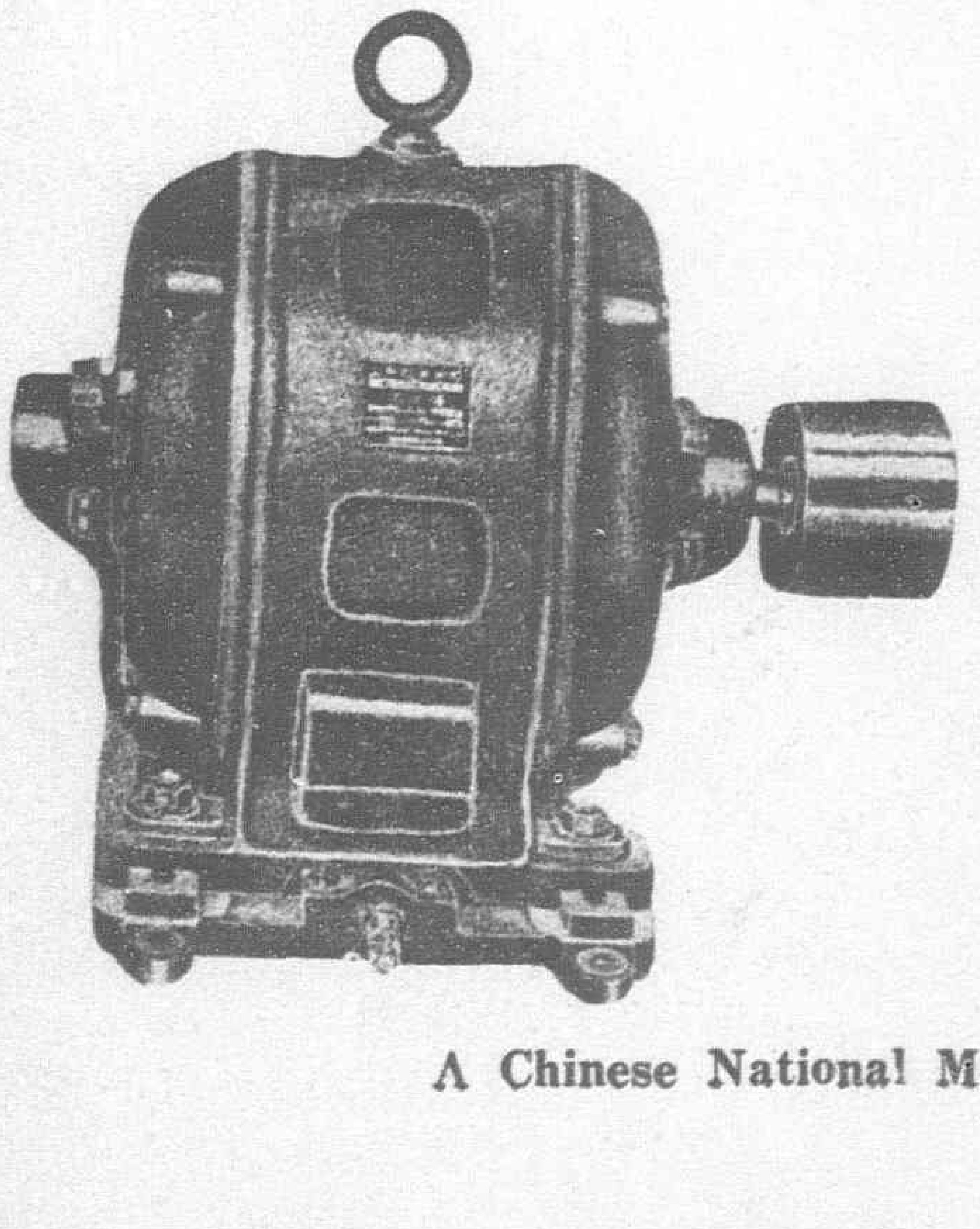
The third engineer employed by the company is T. W. Ching, a graduate of Massachussetts Institute of Technology, and formerly with the Hanyehping Mining Company as electrical engineer, who is in charge of the newly launched manufacture of electric lighting fixtures and switches, most of which are of cheap construction and designed especially for the Chinese market. The aim of the concern is not to compete with the other Chinese manufacturers, in a limited field, but to fill in gaps that are overlooked in certain special classes of electrical work and it is this policy, combined with efficiency in shop management and cutting down the overhead to the minimum, that has led to the success of the company in a comparatively undeveloped trade. From the fact that Mr. Ting attributes the adoption of American factory system, including elimination of the labor compradore, to the survival and growth of his business, while other Chinese firms in the same line of business have failed, it would seem that only such methods enable a company to meet the competition, even with the immense advantages afforded by cheaper production costs. It will be recalled that similar methods are used in the China National Engineers plant and that the only place which is run largely on the Chinese plan, the Wahson Company, was first in the field.

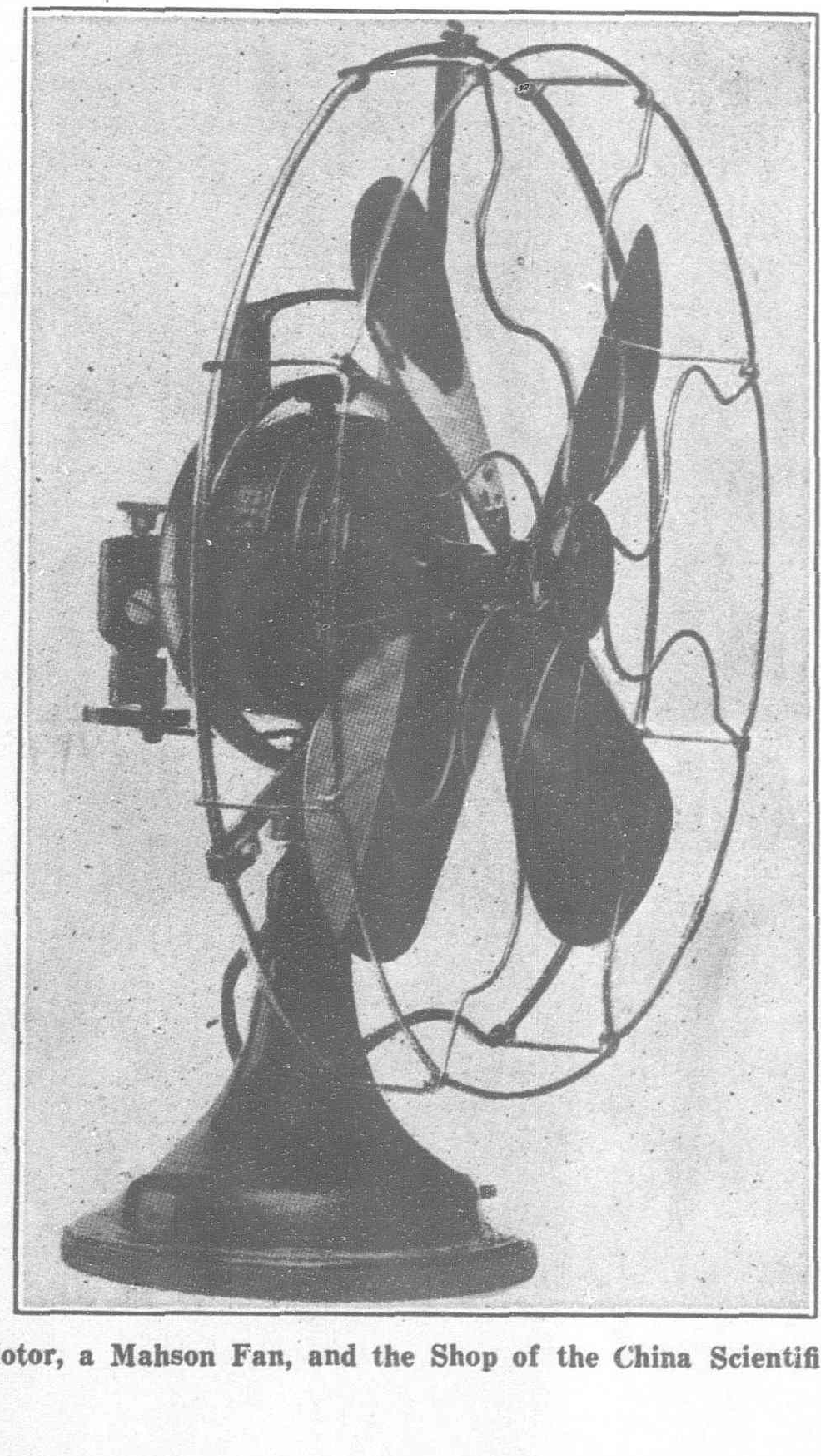
Industry's Future

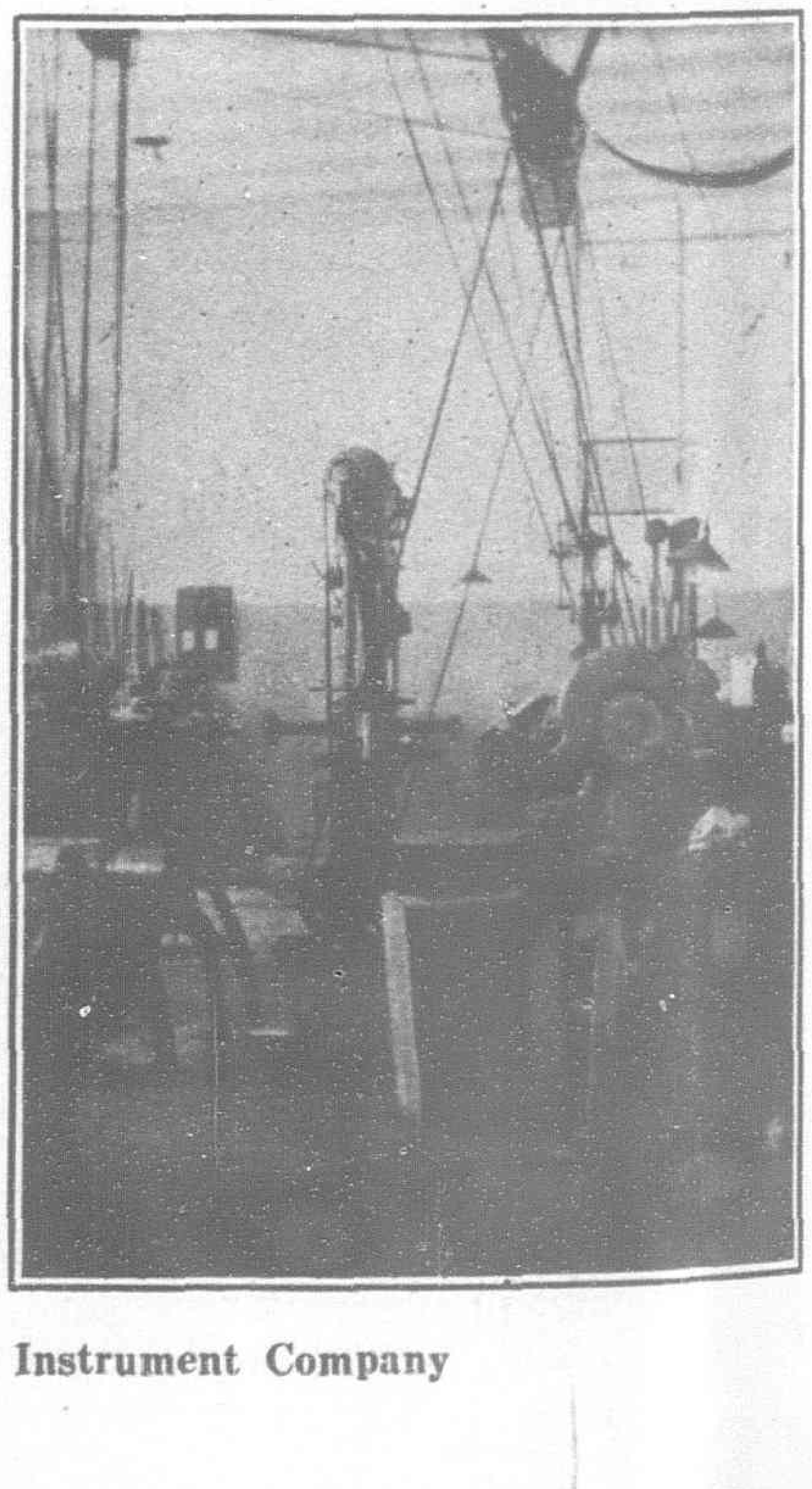
These three examples of successful Chinese firms, and the fourth and outstanding instance of the China General Edison Company, are indicative of the possibilities in this nascent industry. All but one, the latest to be established, have enjoyed a slow and steady growth, and this last has gone ahead with great rapidity in certain specialized lines. In every case it is the lower cost and the perhaps more important factor of suiting the product to the local market, that has enabled them to meet the mass-production competition of the Occident, for the imported goods are as yet superior in quality. The difference in cost is compensated by the fact that goods manufactured in China are guaranteed for a single year, whereas the foreign article is guaranteed for from five to ten years. It is of more durable quality and made with better materials. The same high quality could undoubtedly be turned out in China, but it is doubtful if the cost of the finished article in small-quantity production, would undercut the same commodity of foreign make. In one case, the importers have been able to hold their own with goods produced in European factories, where production costs are cheaper than in America.

But the day is surely coming when the demand will justify many more varieties of products, and those of the best quality, being manufactured in China. The infant industry, already so well nourished, points to that.

(Continued on page 359)







A Chinese National Motor, a Mahson Fan, and the Shop of the China Scientific Instrument Company

The Reinforced Concrete Sleeper

By H. Stringer, B.A., A.M.I.C.E., Late Resident Engineer, Peking-Mukden Railway

IN China up to date the sleeper in almost universal use is the timber sleeper of Japanese hardwood, but its rise in price coupled with the fact that longevity in railway materials becomes increasingly desirable is the cause of renewed consideration of the possibilities of the concrete sleeper, cement being cheap, good and of local manufacture.

With the idea of investigating the actual strains to which a sleeper is submitted actual deflections were measured at three points, rail-seats, and centre of sleeper, and from this the actual deflection in the sleeper was deduced.

Experiments were carried out on 60-lb. track with a six coupled locomotive whose leading and maximum driving axle load was 12 tons. Two sets of trials were made with ballasted and unballasted road. Running speeds were about 15 miles per hour. As would be expected maximum deflections were realised under the unballasted tracks.

Unballasted Track—6-in. consolidated mud packing, 13 sleepers to 30-ft. rail, Maximum deflection, 0.1610 ins.

Ballasted Track—6-in. stone under sleeper, 13 sleepers to 30-ft. rail, Maximum deflection, 0.091 ins.

Ballasted track as above but with 10 sleepers to rail, Maximum deflection, 0.096 ins.

It was observed from these experiments that hog and sag tended to prevail over a length of from 4 to 5 sleepers as would be expected.

For the purpose of arriving at a value for the bending moment on a sleeper the average of the right and left deflections was taken for the calculation of curvature and experiments undertaken with a view to the determination of the value of E the elastic modulus of the timber. The formula used for calculation of bending moment being

$$M=\frac{E\,I}{R}$$

For the determination of E a series of deflection tests on small samples of sleeper wood were undertaken. These were of one inch width by two inches deep and were tested in an ordinary Buckton Machine for bending on a 12-inch span. The results obtained were unexpectedly variable. These results are tabulated as being of perhaps of some use for those who have to deal with Japanese

TIMBER

Load		A Red Wood Deflectiod	B White Oak Deflection	C Hiba Deflection	D Nara Deflection	E Sen Wood Deflection	F Yachitomo Deflection	G Yachitomo Deflection
0.2 tons	...	—	4/64″	1/64″	3/64″	1/64″	2/64″	3/64″
0.4 ,,	...	2/64″	6/64″	3/64″	5/64″	6/64″	4/64″	5/64″
0.6 ,,	...	4/64″	12/64″	5/64″	6/64″	9/64″	8/64″	12/64″
0.7 ,,	...	5/64″	18/64″	6/64″	8/64″	13/64″	18/64″	28/64″
0.8 ,,	...	6/64″	Fracture	11/64″	11/64″	20/64″	35/64″	Fracture
0.9 ,,	...	8/64″		16/64″	18/64″	28/64″	Fracture	
1.0 ,,	...	12/64″		Fracture	Fracture	36/64″		
1.1 ,,	...	Fracture				Fracture		

		Ultimate Tensile Stress Extreme Fibre		*Modulus of Elasticity Tension*
Red Wood	A	5.0 tons sq. inch.	...	1,550,000
White Oak	B	3.6 ,, ,,	...	517,000
Hiba	C	4.5 ,, ,,	...	1,034,000
Nara	D	4.5 ,, ,,	...	620,000
Sen Wood	E	5.0 ,, ,,	...	517,000
Yachitomo	F	4.05 ,, ,,	...	775,000
Yachitomo	G	3.5 ,, ,,	...	620.000
Hailin Pine		3.37 ,, ,,	...	1,250,000 Manchurian timber
Oregon Pine		4.1 ,, ,,	...	2,000,000

N.B.—*E* calculated from deflections under 0.4-ton load.

Finally it was decided to test larger specimens and this was done on a span of 6-ft. 9-in. using a 1-ton weight, as used for testing axles for a central load. This gave deflection of the order of the track deflections and was satisfactory in this respect, but again the results for apparently similar specimens showed considerable variation.

TEST OF 6-IN. DEEP BY 9-IN. SLEEPER.

Span 6-ft. 9-in. load 1-ton central, this giving a bending moment of 3,785-ft. lbs. The central deflection was 0.2100-in. and on removal of the load a permanent set of 0.12-in. was recorded. When the weight was dropped on the specimen from a height of 1-ft. 3-in. failure occurred revealing the presence of a bad knot in the centre.

The calculated value of " E " using the formula $M=\frac{E\,I}{R}$ was 698,000 lbs. per sq. inch.

TEST OF 6-IN. DEEP BY 4½-IN. SAMPLE AS ABOVE.

Test as above; the deflection was 0.12-in. and no permanent set resulted on removal of the load. This gave a value of " E " equal to 2,150,000 lbs. per sq. inch. When the weight was dropped on the specimen from a height of 7-in. a deflection of 0.24-in. was recorded, while with a drop of 12½-in., at which tension failure just occurred, the deflection was ½-in. Assuming " E " constant these deflections under impact were used to arrive at the static effect of a load falling this distance.

Using the formula $d=\frac{W\,l^3}{48\,E\,I}$ where " d " is deflection, W central load and " l " span. The following results were obtained

1 ton falling 7 inches equals 1.69 tons static
1 ton ,, 12½ ,, ,, 3.52 ,, ,,

The impact method was used later for testing concrete sleepers and this gives some indication of the order of the stresses under impact.

For the calculation of the bending moment on the sleeper which gave maximum deflection it was assumed that the curve of flexure was circular in the formula $M=\frac{E\,I}{R}$

For E equal to 2,150,000 the bending moment was 5,300-ft. lbs.

For E equal to 690,000 the bending moment was 1,700-ft. lbs.

For E equal to 1,500,000 the approximate mean and the usual value of E for timber the bending moment worked out at 3,700-ft. lbs.

To check these results it was decided to investigate the resistance moment properties of steel sleepers. It was found that the maximum Resistance moment for

	Approx. weight	
Rendel Steel Tie	135 lbs.	3,840-ft. lbs. at centre.
Post ,, ,,	90 ,,	3,540 ,, ,,

The following table* is an indication of steel sleeper practice in China and elsewhere and, if weights are an indication, it appears to indicate the adequacy of the Rendel Tie for such weights in China and of the adoption of a resistance moment of this order in concrete sleeper design.

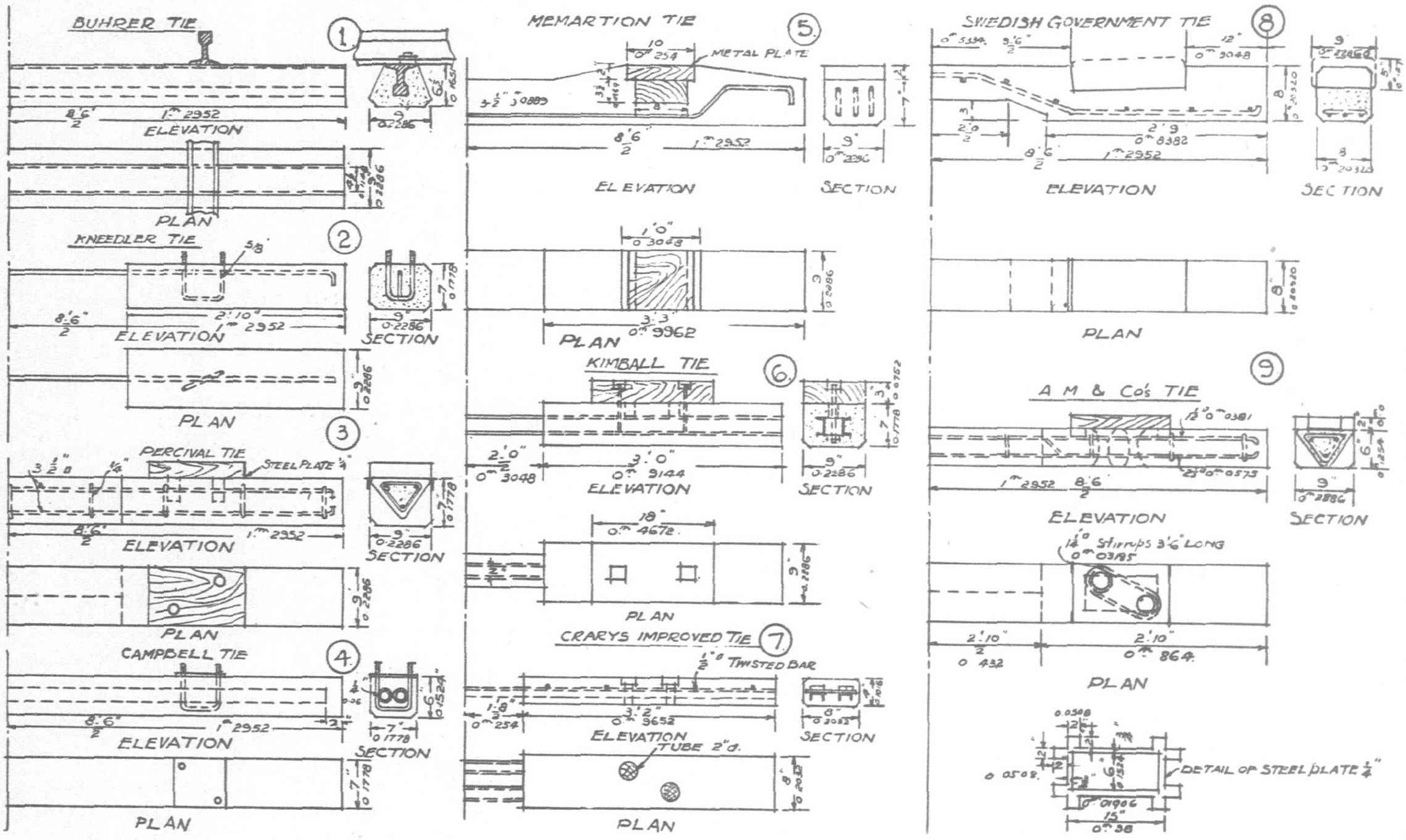
Railway		*Weight of sleeper* lbs.	*Number to mile*	*Ballast per mile*	*Weight of rail* lbs.	*Gauge*
German, S. W. Africa	...	26	—	—	30	2′ 0″
German, S. W. Africa	...	60.5	1,600	—	40½	3′ 6″
(Above information derived from "Railway Engineer" of February 1916).						
Sierra Leone	...	40.5	—	—	30	2′ 6″
North Nigeria ...	...	70	—	—	45	2′ 6″
South Nigeria ...	...	82	—	—	55	3′ 6″
(Above derived from "Railway Engineer" of April 1910).						
Rhodesia Railways ...	...	70	1,920	1,700 c. yds. sand lift	60	3′ 6″
Shire Highlands ...	...	70	—	—	41½	3′ 6″
(Above derived from "Railway Engineer" of February 1909).						
Lunghai Railway, China	...	131		length 39′ 8″	85	—
Woosung Railway, China	...	112	15 to rail	—	65	4′ 8″
					length 39′ 4″	
Yu-nan Railway, China	...	79.2	2,000	1,842 c. yds. gravel	50	Metre
Shantung Railway, China	...	110	1,760	—	60	4′ 8½″
India	...	139	2,000	8 ins. below	75	5′ 6″
India	...	70	2,000	6 ,, ,,	50	Metre
Australia	...	28	2,640	—	24	2′ 0″
Mexico, Southern ...	...	84	2,420	—	50	3′ 0″
Egypt	...	(110.2 (132.2	10 to rail	—	95	
					length 12 metres	

(*N.B.*—An earlier sleeper on the Mexico Railway weighed 64 lbs. and was removed. On the Inter-Oceanic Railway a 90 lb. sleeper is used under a 40 lb. rail for the same gauge. Information derived from Tratman on Track). *Extracted from "Pioneer Railway Engineering" by H. Stringer.

In the design of the concrete sleeper first adopted the reinforcement consisted of two old boiler tubes as in the figure. The ends of these tubes were flared to give increased adhesion. The concrete in all cases was 1.2.4 with ¾ inch stone or less. This sleeper was tested in the same manner as the wooden sleeper.

Applied bending moment 3,785-ft. lbs. deflection 0.12-in. on removal of all the applied 1-ton load there was no permanent set.

The sleeper was then tested by allowing the weight to fall through 2 feet and it broke too easily indicating overload.



SCALE ½" = 1 FOOT

TIE No	VALUME OF CONCRETE CU. FT	WEIGHT OF REINFORCEMENT lbs	FITTINGS		COSTS $				R. M. CONCRETE FT. lbs.	
			STEEL lbs	WOOD B. M.	CONCRETE	REINF	FITTINGS	TOTAL	RAIL SEAT	CENTRE
1.	2.00	170.00			0.68	18.50		19.18		
2.	2.48.	29.90.	3.76.		0.84	3 24	0 41	4.49.		
3.	3.10	24 00	5.10	3.75.	1.05	2 60	0.93	4.58	2857	1920
4	2.15.	79.20	10.71		0.73	8.58	1 16	10.47		
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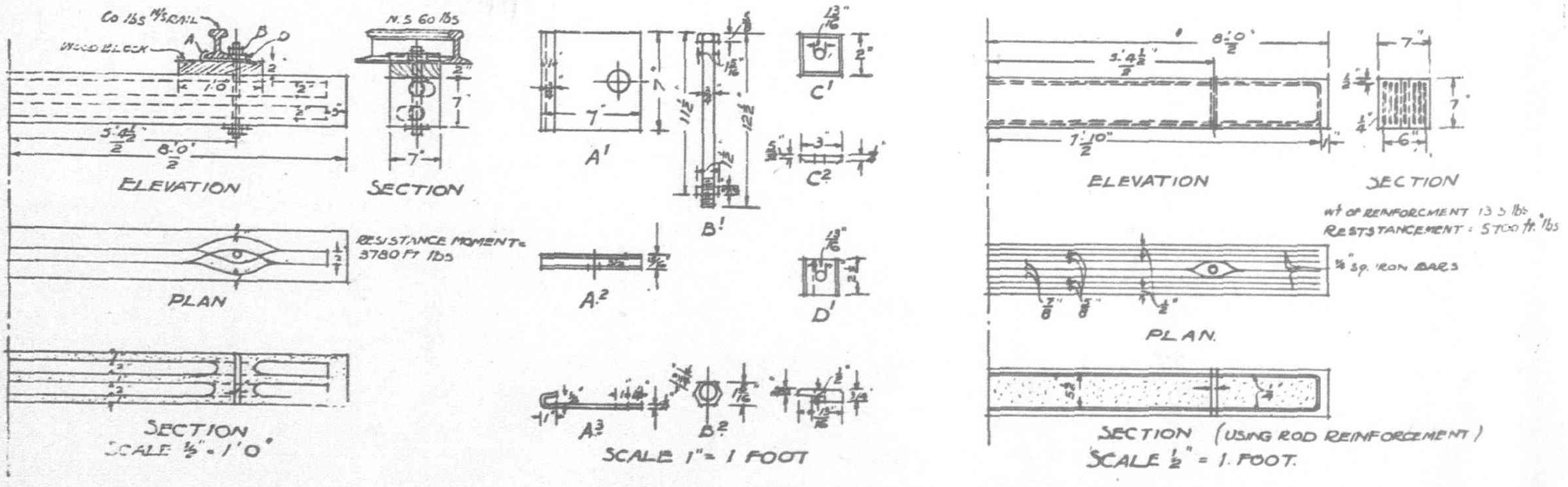
ASSUMPTION

COST OF CEMENT = $ 5 00 PER BARREL
" " BALLAST = " 6 00 " FANG (= 6.0 CU. YARDS)
" " SAND = " 3 00 " "
" " CONCRETE = " 9.12 " CU YARD.
" " TIMBER = " 10 00 " 100 BOARD MEASURE
" " STEEL = TAELS 175 " TON = $ 243 PER TON

PEKING MUKDEN RAILWAYS REINFORCED CONCRETE SLEEPER (1 2 4)



A second sleeper was then tested of similar design and gave a deflection of 0.24-in. under the applied bending moment of 3,785-ft. lbs. but there was a permanent set of 0.06-in. on removal of the 1-ton load. When tested under impact this specimen just failed under a drop of 6 inches indicating no very high factor of safety if any reliance is to be placed on the static value obtained in the case of the wooden sleeper.

In calculating the resistance moment of these sleepers it was assumed that the area of steel 0.29-in. was concentrated (0.29-in. square being the area of each boiler tube) one inch below the concrete surface. The resistance moment for a beam reinforced for compression and assuming an extreme fibre stress of 600 lbs. per sq. inch for the concrete was 3,785-ft. lbs. or virtually the bending moment applied.

A test was also made on a sleeper used for sidings under light loads as in wagon repair sidings. This sleeper had a single boiler tube placed centrally, the concrete being as above and the fastening consisting of ordinary track spikes cast in the concrete, two only for each sleeper, spikes being placed to take the inner and outer edge of the rail flange alternately.

This sleeper whose calculated resistance moment is 520-ft. lbs. stood up under the applied bending moment of 3,785 ft. lbs. without showing signs of failure other than the development of permanent set.

In all cases the tubes employed for re-inforcement were scrap and this in all probability accounted for the failure which occurred, under trial and determined the adoption of rod re-inforcement as in the figure. In this sleeper the amount of re-inforcement has also been doubled that on *each* face of the sleeper amounting to 0.9 per cent. against 0.59 per cent. for each face of the boiler tube sleeper. Inspite of this it will be observed that the amount of re-inforcement is less than any of the usual types of concrete sleepers of which a table is appended.

The fastening for this sleeper had given no trouble up to end of 1925 and had been on trial for about two years. Altogether 70 sleepers with this fastening have been placed in the track under 14-ton axle loads (fully ballasted 60-lb. rail with 11 sleepers to the 27-ft. rail). There was only one breakage but cracks developed in 10 sleepers which did not develop so as to necessitate removal. The type with rod re-inforcement has developed no defects so far but has only been on trial for a short time, its calculated resistance moment as a beam re-inforced for compression is 5,700-ft. lbs. or more than the upper limit of bending moment deduced from the track deflection experiments. It is realised that the sleeper is heavy but its construction is very simple, the great desideratum in a foreign country.

An observation of a considerable number of failures of concrete sleepers indicate that the overwhelming majority fail in the centre indicating either a supporting pressure somewhat of the order in the sketch with a maximum pressure in the centre or an even distribution between the rail seat and practically no pressure at all outside this. This hypothesis appears feasible when it re-collected that shocks and vibration must have the greatest loosening effect on packing at the rail seats

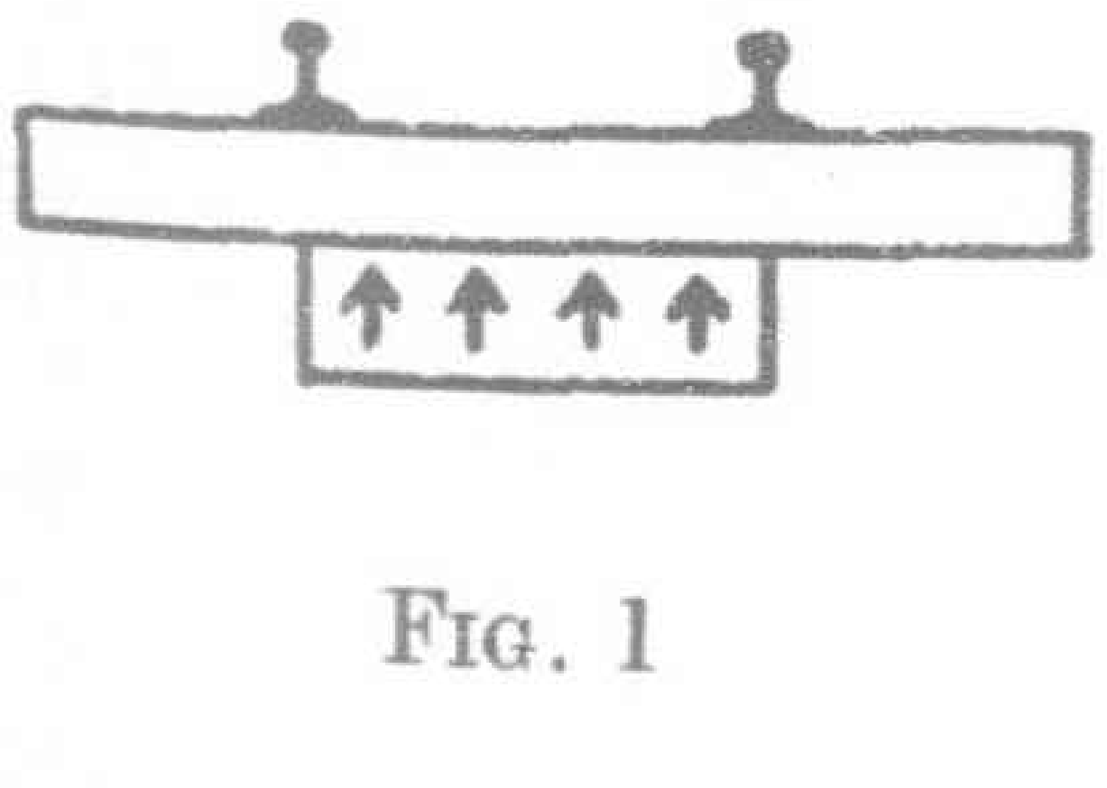


FIG. 1

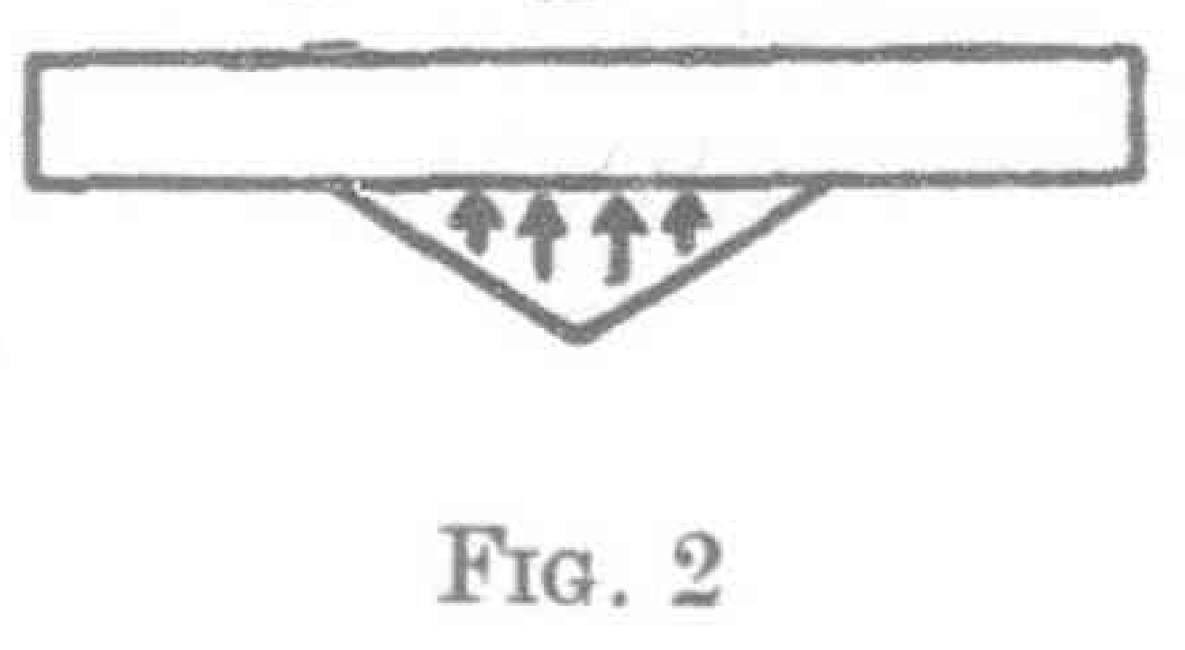
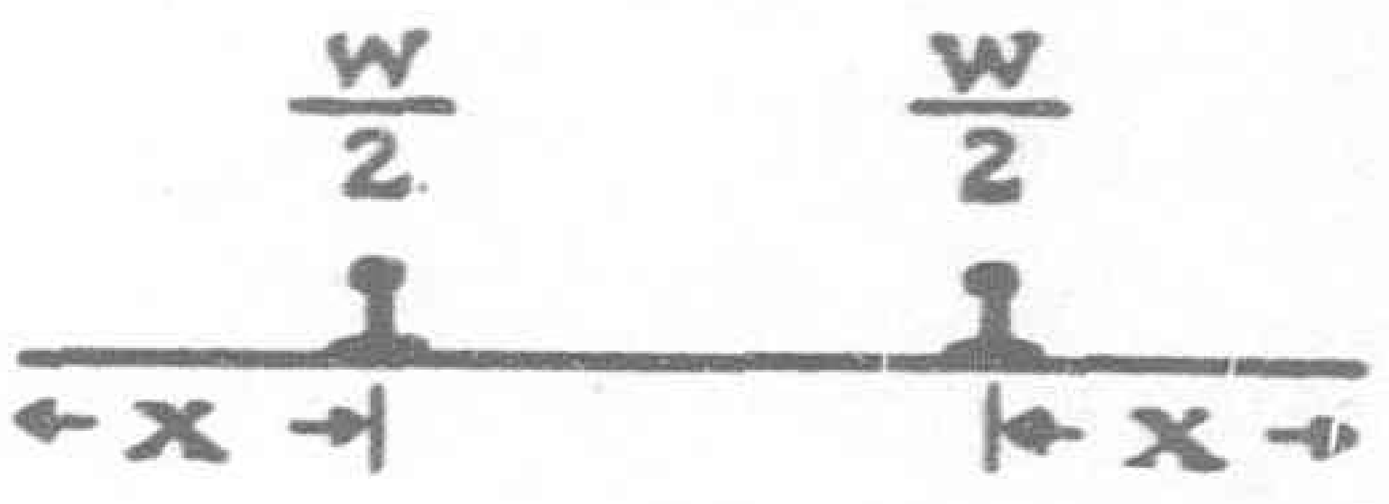


FIG. 2

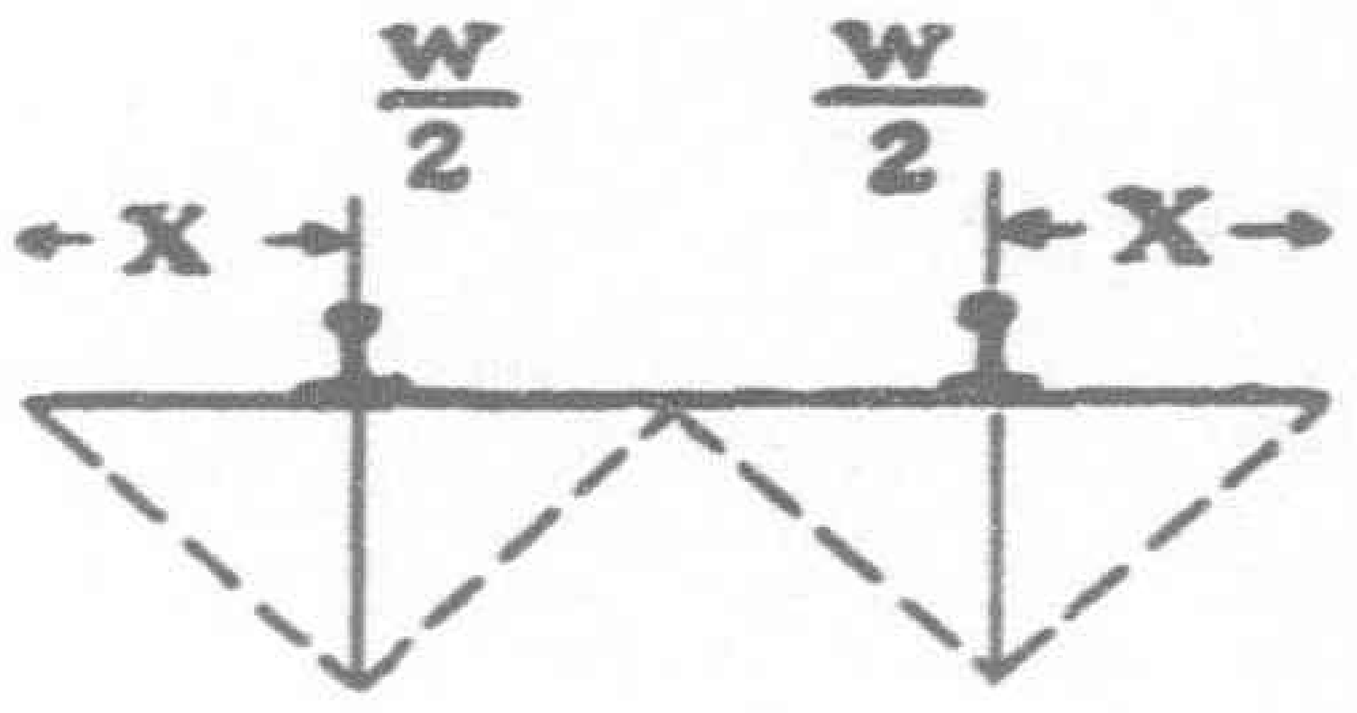
For the case represented in figure 1 the maximum bending moment on the sleeper is $\frac{W L}{6}$ and to produce the maximum recorded bending moment of 5,300-ft. lbs. would only require an axle load of 2.85 tons on the sleeper if L is assumed at 5 feet.

For the case represented in figure 2 the maximum bending moment is $\frac{5}{8}$W and the axle load required to produce a bending moment of 5,300-ft. lbs. under the above conditions would be 3.8 tons.

If the supporting pressure is considered uniform and acting on the whole length of the sleeper (8 feet) the maximum bending moment is at the rail seat and is $\frac{W x^2}{2 L}$ and this would need an axle load on sleeper of 16.8 tons to produce 5,300 ft. lbs. bending moment. Obviously the more nearly packing conditions approach to this state of things the better especially from the concrete sleeper point of view.



If the supporting pressure is as in the sketch below the maximum bending moment is at the rail seat and equal to $\frac{W x^2}{3L}$ requiring an axle load of 8.3 tons to produce the 5,300-ft. lbs. of bending moment.



Consideration of the wheel loads of the engine and the established fact that impact apart rail deflection under a wheel load does not extend over more than 3 sleepers and with distances apart of axles of wheels equal to from 2 to 3 times sleeper spacing maximum rail load does not exceed 39 to 44 per cent. of wheel load, seems to indicate that the last two conditions are impossible and that the real condition of things lies somewhere between the two pressure distributions first cited a contention supported to some extent by observation of failures. There may be high pressure at and outside rail seat after packing but this state of things does not persist.

Undoubtedly in these days longevity should outweigh economics. War conditions have amply demonstrated the wisdom of the adoption of an all steel road and a 39-ft. rail on the Lunghai Railway, and the use of the jarrah sleeper on the Shanghai-Nanking and Kowloon-Canton Railways.

However, with regard to the economics of the sleeper question in China, the cost in dollars of the boiler tube and rod re-inforced sleeper is $1.93 and $2.20 respectively against a cost of $2.25 for the Japanese hardwood sleeper. These costs are without fittings. As, showing the impossibility on this ground of introducing the steel sleeper with success at the present time, the following contrast between capital invested is illuminating.

Capital invested in steel sleepers weighing 150 lbs. costing originally $12.20 at the rate of $182 per ton (£26) and assuming 32 years life at 8 per cent. compound interest is $143.20.

Capital invested in Japanese hardwood sleeper 8 years life each and costing originally $2.25 under above conditions as to interest is $53.54. Convert to sterling at the rate of $10 to the pound. It is thus seen that until China elects to make the cheapest steel in the World, as she could do were foreign aid adequately enlisted, concrete is the only possible substitute for timber* which is rapidly deteriorating in quality. Unfortunately nothing is known of the life of the concrete sleeper at present so far as I am aware.

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* Of late years it has been the practice on the Peking-Mukden Railway to buy Oregon Sleepers costing in 1925 $2.65 per piece.

Did the Greatest Conflagration in History Teach Its Lesson to Business Men?

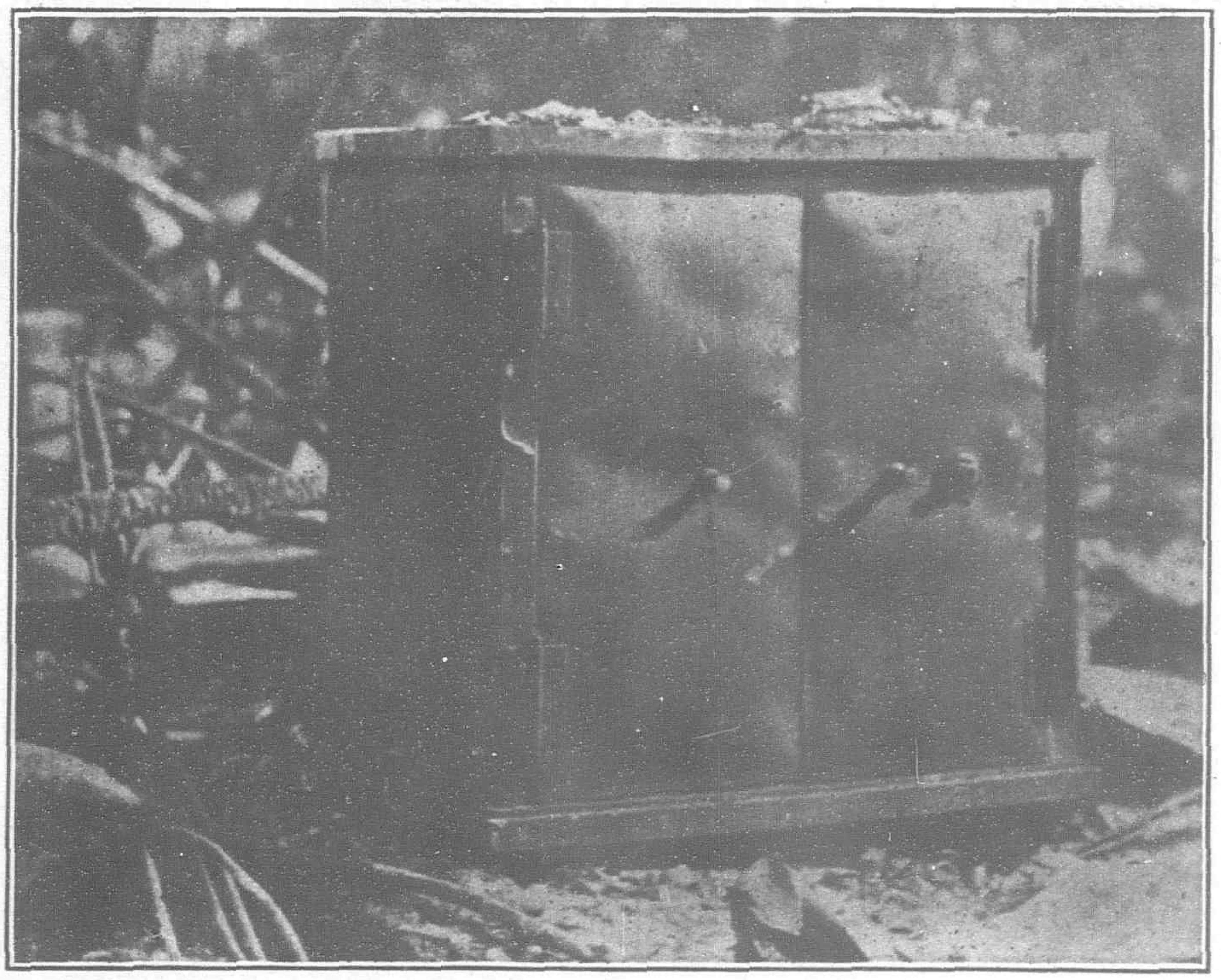
SATURDAY, September 1, 1923, will long be remembered in Japan because on that date occurred the most terrible disaster that ever befell any civilized country. Except for a brief shower of rain in the early hours of the morning, the day broke calm and fair as any other day in Tokyo.

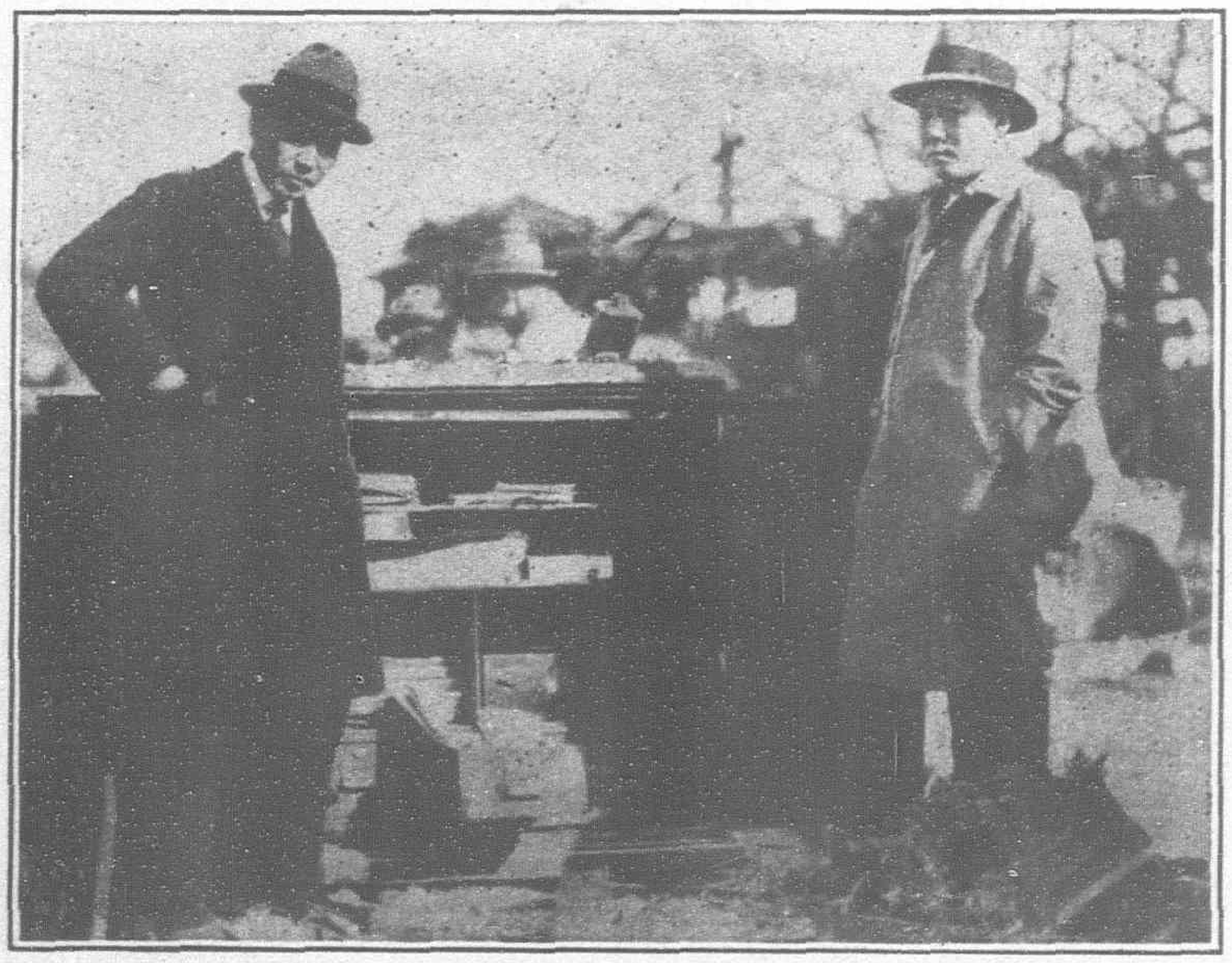
Nothing unusual happened until 11.58 a.m., when a great rumbling sound was heard, approaching from afar, followed immediately by a series of vertical earthquake shocks. Before these vertical shocks had fully subsided, horizontal shocks of unusual strength twisted the ground surface, buildings, street car and railway tracks into fantastic shapes and positions. As these convulsions continued, tearing walls and roofs apart, all Tokyo, save those unfortunates who had been caught in the first crash, was out in the streets.

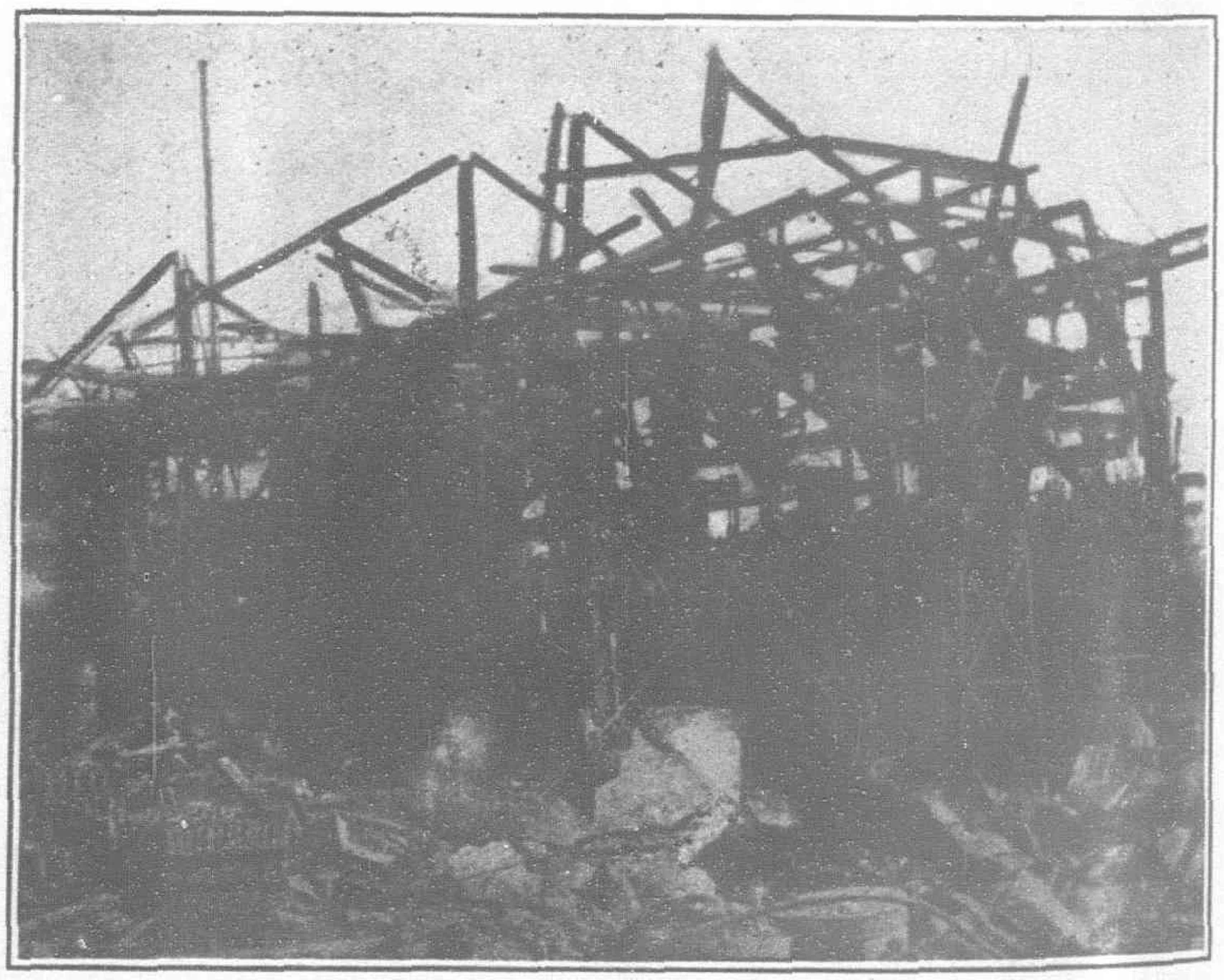
The records at the Central Observatory, Tokyo, show that there were 1,319 separate and distinct shocks during the first three or four days. The loss of life and property atributed to the earthquake was caused by the first shocks but by far the greater proportion of property damage sustained and lives lost is generally accredited to the sweeping conflagration that followed. It is estimated that in Yokohama, the proportion of damage was due approximately 60 per cent. to the earthquate, and 40 per cent. to the conflagration. In Tokyo, the earthquake loss was small, being not more than 15 per cent. of the total damage, while 85 per cent. of the damage sustained was due to the conflagration.

The Insurance Situation

All standard fire insurance policies in Japan, as well as several other countries of the Far East include an " Earthquake Clause." This specifies that the policy does not cover losses incurred on account of fire if such fires are directly or indirectly due to earthquakes. Added protection covering losses incurred on account of earthquake conditions, can be secured by the payment of additional premium. Whether the Earthquake clause was understood and its significance appreciated in Japan is open to debate. Had this clause been understood and appreciated by the Japanese business men, who recognize that Japan is more or less subject to earthquake conditions, it would seem that they would have availed themselves of this additional protection. The facts are, however, that with only very rare exception







AMERICAN SAFE-CABINETS SURVIVED THE CONFLAGRATION

November 14, 1926, the factory of the Yai Dry Battery Company at Tokyo was completely destroyed by fire. Only a twisted mass of iron and steel remained. The Yai Dry Battery Company suffered a loss of Y.250,000, most of which, however, was covered by insurance and the records necessary to prove the amount of loss and collect the insurance policy itself were preserved in two Safe-Cabinets. These safes also contained test papers, drawings, and other papers of great value to the company, all of which were found in perfect condition.

were the insurance policies written to provide protection against loss incurred on account of earthquake conditions. Therefore, the vast majority of policy holders have been unable to collect any insurance to cover their losses.

Records Lost

The frequent non-committal attitude of fire stricken peopel coupled with the scattering of the thousands of refugees over wide areas, with no addresses or directories made impossible any comprehensive check-up as to results of specific record loss. This was not felt for many months, but equalled, if not exceeded, as it does in America, the loss in tangible property.

It was commonly known that the Japanese Patent Office lost all their records which caused untold loss, inconvenience and uncertainty to Japanese and also to foreign manufacturers. Many cases may be taken as fairly indicative of the growing realization of the vital part records play in business and the loss brought about through their destruction by fire.

Vaults

Vaults are commonly used in Japan for housing records and in private homes and estates for storing valuable kimonos, costly wearing apparel, relics and other household effects. Many of these vaults are constructed separate from the buildings and homes, and are generally of brick or brick and concrete. Frequently vaults were build with window openings, and when such vaults were located in the burned area, they failed without exception. On many better record vaults, because the door openings were protected only by ordinary steel doors, the doors warped or offered no practical degree of protection against the high heats that were generated, and the contents were completely destroyed.

Still other vaults were found with cracks in the walls, some of which may have been caused by the earthquake shocks. The heat penetrated through the cracks and destroyed the records and valuables hwich they contained. One of the largest Japanese banking institutions was commonly reported to have has its gold specie melted inside a most substantial vault.

Both inside and outside of vaults steel filing cabinets were used to a slight extent only, Japanese wooden cabinets being more common. In no case could it be found that filing cabinets of either steel or wood protected their contents.

Safes

Survey of the burned area shows that heavy iron safes similar to those commonly seen in America were in general use in practically every place of business. While it was customary Japanese practice to set these heavy safes on a concrete foundation and therefore most of them did not fall, it is said that they did not protect their contents any more frequently than did safes of similar construction in the famous Baltimore and San Francisco fires. It is variously estimated that there were from 25, 000 to 40,000 heavy iron safes in use in the burned areas and it was, of course, impossible to make a complete survey of this number. However, from an examination of a large part of the burned area, and from the number of cases where complete data could be obtained, it is a fair estimate to say that failures ranged from 65 per cent. to 80 per cent. of the entire number.

The Safe-Cabinet

Not only was the total number of safes in the Japanese fire the largest in the history of the world, but also there were more Safe-Cabinets in this fire than in any one previous conflagration,—there were 152, mostly severe exposure and medium exposure types. Like all other safes, they were subjected to the terrific conditions that prevailed. Unlike practically all of the heavy iron safes, however, their relative light weight had led to their not being set upon concrete bases, and in many cases they fell several floors into the ruins. The owners of fourteen of these Safe-Cabinets could not be found after the conflagration. The remaining 138 were interviewed. Six of them stated that in their panic they had failed to close the safe doors. Of the remaining 132 Safe-Cabinets, it was found that 100 per cent. of the Severe Exposure type had delivered their contents unharmed to their anxious owners, and 83 per cent. of Medium Exposure had protected their contents perfectly. It goes almost without saying that such a showing in the world's worst fire, and not by a few instances, but by mass of evidence, has carried the business men of Japan by storm and cannot be otherwise than a striking endorsement to all the world's people who have records to protect. In a large majority of cases, burned records mean ruined business. Did the greatest conflagration in history teach this lesson to business men ?

Japan was again the scene of a devastating fire when flames destroyed 200 large and small buildings in Tokyo on the morning of November 14, 1926. Starting at 3 a.m., the blaze made quick work of the wooden structures, and in three hours had reduced them to a pile of smouldering ruins. Among the buildings destroyed was the large two-story wooden structure of the Yai Dry Battery Company. This building burned fiercely for three hours, at the end of which time all that remained was a mass of twisted iron and steel that had supported the roof and machinery.

The Yai Dry Battery Company suffered a loss of Yen 250,000 in the building and its contents. Most of this, however, was covered by insurance, and the records necessary to prove the amount of loss and collect the insurance policy itself, were preserved in two Safe-Cabinets. These safes also contained test papers, drawings, and other papers of great value to the company, all of which were found in perfect condition.

The fire insurance policy is a definite contract between the insured and the insurer wherein the latter agrees to reimburse the insured for proven loss up to the face value of the policy and the insured agrees to exercise all reasonable precautions against fire ; to pay for the policy ; and prove loss by producing evidence of the amount and value of goods in stock at the time of the fire. Most business men do not know it is necesasry to prove the amount and value of stock on hand at the time of the fire before the insurance company will make settlement.

Insurance companies do not take advantage of technicalities to escape paying losses. They can no more afford to pay an unitemized invoice for burned merchandise than a business can afford to pay a bill without checking it to determine quantity, quality and price. When the insurance company settles a fire loss they are buying an ash pile. The owner must prove that a definite amount of goods, valued at a proven price, was in the ash pile before the insurer will settle the claim. This is the only way the insurer can prevent fraud.

The insured should read and understand the conditions in his policies and be prepared to meet the requirements after his fire. The fundamental conditions or clauses in fire insurance policies are universal. Insurance collection for the full amount of loss, up to the face value of the policy, is entirely different from insurance adjustment where the terms are dictated by the insurer. In an adjustment, fought out between the insured, the insurer and a referee or third party, or in court, the entire burden of proof is on the insured. He is at a tremendous disadvantage. At best he will secure a delayed payment of only what he can compel the insurer to pay.

Book Reviews

Edgar Allen & Co., Limited, have sent us their booklet " Drilling with Perfect Alignment." This contains full details of the Barnes Patent Floating Straight Shank Twist Drills. The booklet contains 36 pages, and gives details of the principles, operation and performance of these drills, togehter with list prices of both the drills made on this principle and the floating drill chucks for Morse taper drills. Advantages of this special drilling principle, results of tests on the drills themselves, and the method of operating a Barnes patent floating chuck, are all adequately, clearly and comprehensively described.

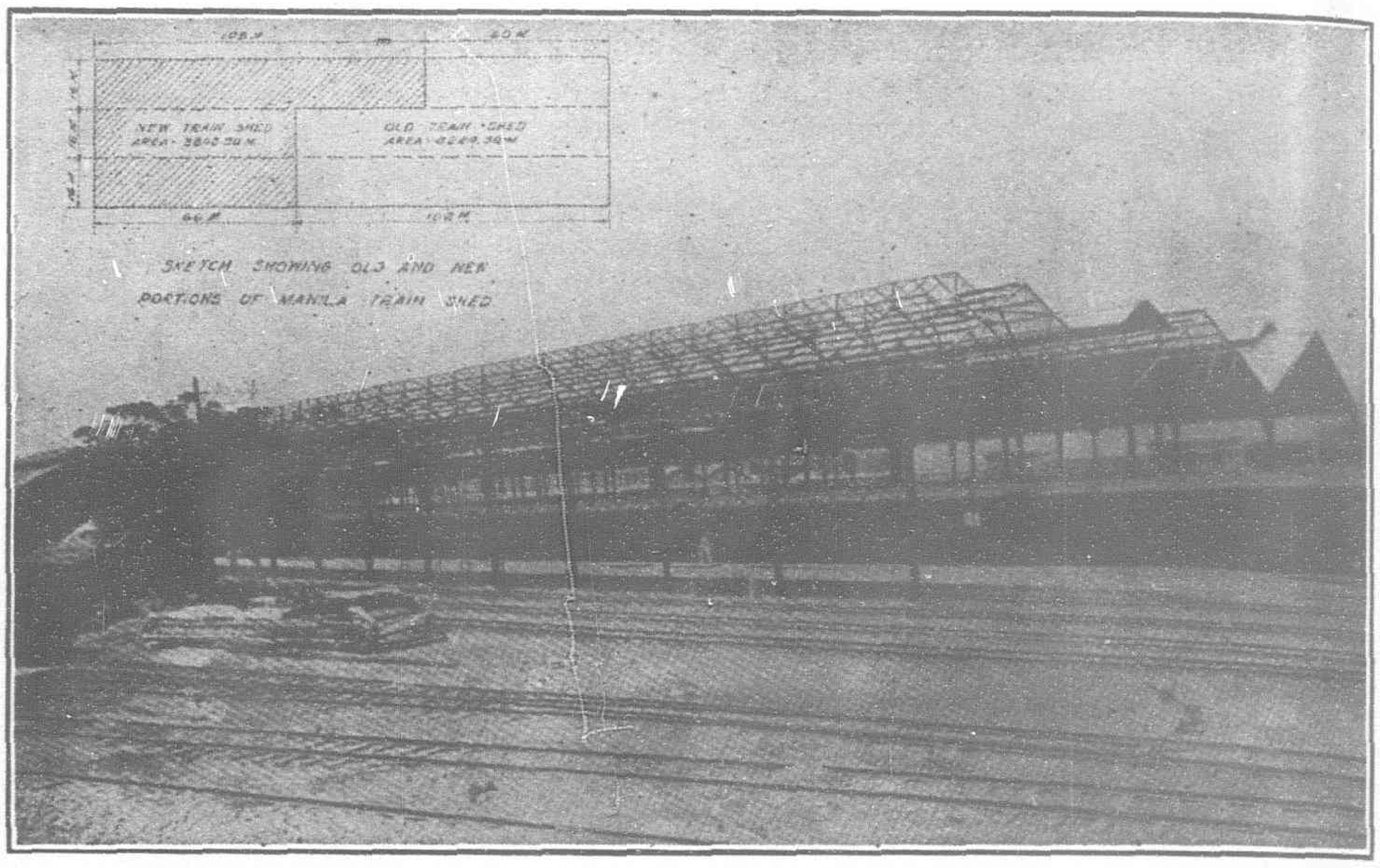
A copy of the booklet will gladly be sent to any genuinely interested person mentioning " The Far Eastern Review."

A. Reyrolle & Company Ltd., have recently issued an interesting booklet on " Plugs," the Purpose of which is not only to being to notice the unrivalled merits of " Reyrolle" Switch Plugs, but also to guide and help in determining the most suitable positions in which to install them. There should be at least one Outlet Socket fitted in every room in the house, and it will often be found convenient to increase this number.

The booklet in insturctive and well-illustrated. Copies may be obtained by writing to the Company at Heburn-on-Tyne, England.

The Manila Railroad

THE annual report of the general manager of the Manila Railroad Company always contains valuable data on railroad development in the Philippines. We are herewith reproducing several valuable items :



View Showing Incompleted Manila Train Shed Extension, Covering an Area of 3,840 Square Meters

Railway Construction

Raising grade between Paniqui (Km. 139.52) and Bayambang (Km. 163.39).—This work, including the construction of five additional 20 meter thru spans at the south end of the bridge over the Agno River between Bautista and Bayambang, was referred to in detail in the report for 1925. This project was entirely completed by July 1, 1926, at a total expenditure of £412,628.81. No trouble of any kind was experienced in this section during 1926.

Tondo foreshore reclamation.—On December 31, 1925, about 80 per cent. of the fill work in the area to be reclaimed was uncompleted. At the end of 1926 only about 25 per cent. remained to be completed. The greater part of the filling during 1926 was accomplished by the use of suction Dredge No. 4 belonging to the Bureau of Public Works instead of hauling in material on flat cars as had been done previously. The Bureau of Public Works is cooperating with the Manila Railroad Company in this reclamation work, the arrangement being that the Government receives reimbursement for the actual cost of labor, coal, oil and other supplies consumed in the operation of the dredge without making any rental or other charge for its use. The filling performed by Dredge No. 4 has been most efficient and economical.

Additions and Betterments

The yard trackage at the following stations was increased a total of 2,100.46 meters as indicated below :

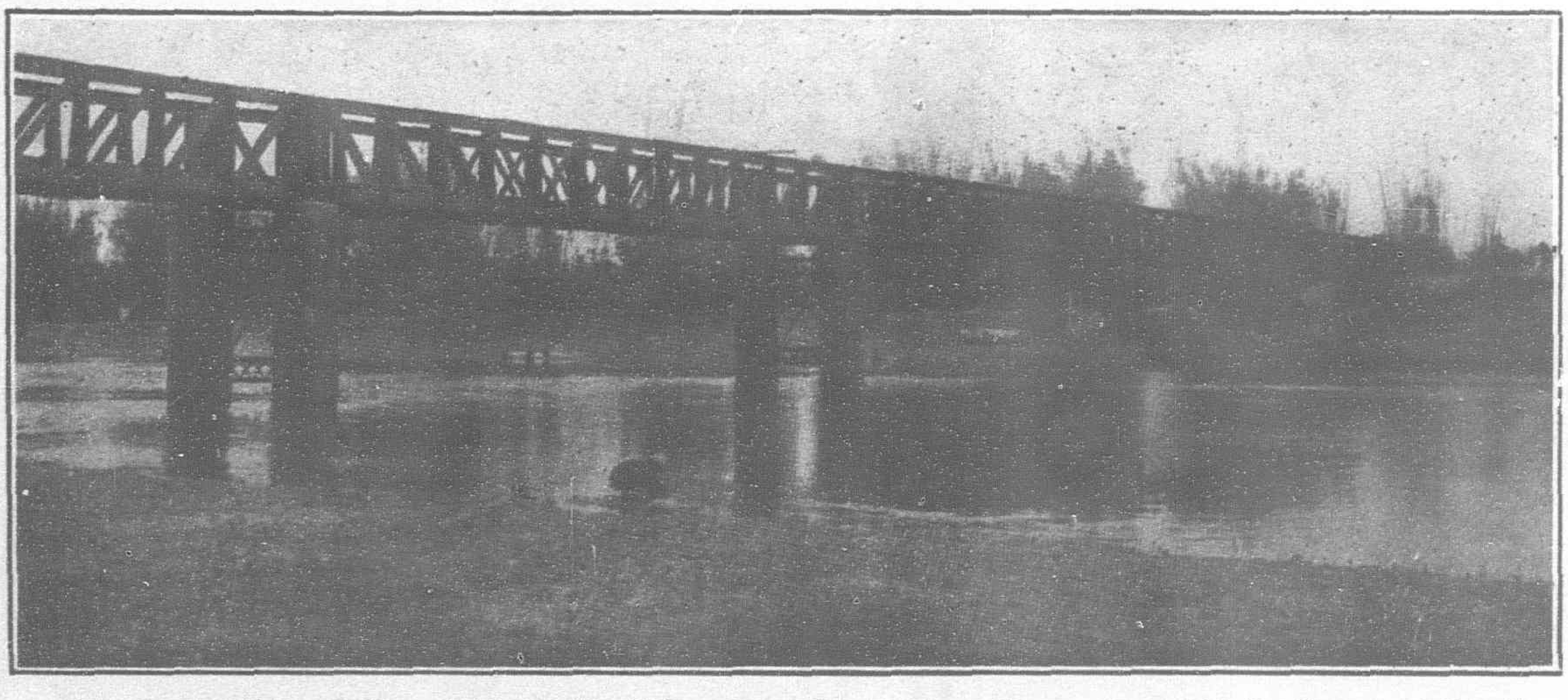
	Meters		Meters
Malolos	639.92	San Pedro, Laguna	157.61
Apalit	103.37	Manila	775.00
Santo Tomas	119.56		
Candelaria	305.00	Total	2,100.46

During the year 1926 seven industrial spur tracks (16 in 1926) were constructed as follows :

	Meters
Km. 65.695, Main Line North, Pampanga Sugar Mills	72.85
Km. 67.538, Main Line North, Pampanga Sugar Mills	87.00
Dau Station, Main Line North, Pampanga Sugar Mills, Turnout only.	
Km. 85.781, Main Line North, Central Luzon Milling Co.	83.69
Km. 92.626, Main Line North, Central Luzon Milling Company, Turnout only.	
Km. 90.900, Main Line North, Pampanga Sugar Mills	72.25
Km. 88.997, Florida Blanca Line, Pampanga Sugar Mills	64.00
Total	379.77

Ten steel bridges with spans having a total length of 980 feet (945 feet in 1925) were constructed at the following places :

Km. 25.350, Main Line North	Two 20-meter thru spans.
Km. 151.326, Main Line North	Four 12-meter thru spans
Km. 34.945, Cabanatuan Line	One 100-feet thru span.
Km. 97.363, Cabanatuan Line	Three 100-foot thru spans.
Km. 54.550, Main Line South	One 45-foot thru span.
Km. 230.143, Main Line South	One 80-foot thru span.
Km. 56.704, Canlubang Line	One 17-foot deck span.
Km. 57.808, Canlubang Line	One 10-meter deck span.
Km. 57.854, Canlubang Line	One 8-meter deck span.
Km. 58.233, Canlubang Line	One 45-foot deck and two 5-meter deck spans.
	Total length 980 feet.



Penaranda River Bridge K.M. 97-98, Cabanatuan Line. View Shows four 100-ft. Spans at North End of Bridge. Entire Bridge Consists of Thirteen 100-ft. Spans, of which three were Erected in 1926

The three 100-foot thru spans at Km. 97.363, Cabanatuan Line, have replaced the wooden approaches of the Peñaranda River bridge, two spans having been erected at the south end and one at the north end of the bridge. This is one of the longest bridges belonging to the Company, having a total length of 1,300 feet, and with the construction of these three spans all timber trestle work has now been replaced with steel and concrete. The 100-foot thru span at Km. 34.945, Cabanatuan Line, is at the south end of the Quiñgua bridge and is a similar span to the one that was erected in 1925 at the north end. The placing of these two additional spans at both ends of the bridge will undoubtedly entirely obviate any trouble that might otherwise occur as a result of embankment erosion at this point.

Rail relay.—All of the Florida Blanca branch line from Szn Fernando to Carmen, a distance of 28.51 kilometers, was relaid with 65-pound rail replacing the old 45-pound rail. The Canlubang line from Mamatid to Canlubang (6.802 kms.) where the Calamba Sugar Estate central is located, was also relaid with 65-pound rail. Both branch lines are now in proper condition to withstand the heavy traffic handled during the milling season.

Buildings

Manila incoming freight shed.—The incoming freight handling and storage facilities for less than carload freight heretofore located in a portion of the old Syquia property were entirely inadequate to the volume of traffic received, besides being inconvenient and unsafe. Consequently, as recommended in the last report the construction of a modern building for incoming shipments was authorized during 1926. The structure is of reinforced concrete with steel trusses ; dimensions, 32 meters wide by 75 meters long, covering a total area of 2,400 square meters, with an uncovered platform 550 square meters in area. The building is equipped with rolling lift steel doors and " Fenestra " reinforced windows. Construction was about 80 per cent. completed at the end of 1926.

Manila train shed extension.—This is also one of the items of improvements recommended in former reports. Insufficient protection has heretofore been afforded to passengers departing from or arriving at the Manila Terminal station on account of the train shed being too short and not covering exposed sections of the train platforms and tracks. This has been particularly inconvenient during the rainy season. The work contracted for and started during 1926 comprises the construction of steel columns and roof trusses with corrugated zinc sheet roofing, the entire structure covering a total area of 3,840 square meters. At the end of the year all fabricated steel had been delivered and the columns erected. This project will be completed during the early part of 1927.

A two-story addition to the Engineering office building, 8 × 8 meters, was made following the type of the old building.

A reinforced concrete building 8 meters by 6 meters was constructed to be used by the Transportation office on the Murallon near the spur track leading to the Pasig River north wall.

An addition 3.60 × 4.80 meters was made to the south end of the Lopez station building for a freight room, following the type of the old building.

A station building 4.25 × 12.75 meters with open waiting room and arcade was constructed at Yawe, Km. 171.98, Main Line South.

"Made in China"

(Continued from page 352).

There is, for example, a Chinese periodical, " The Chinese Engineering Society Journal," which appears quarterly and is now in its third year, devoted exclusively to discussions of a purely technical nature on current developments. The Society which publishes this journal, aiming at developing the natural resources of China, in 1924 organized a material testing committee of Chinese engineers to find out the specific properties of the various raw materials available here in such abundance, and this committee has functioned regularly with various kinds of building materials and metals. Now the Society is campaigning for $50,000 to build a large industrial research laboratory.

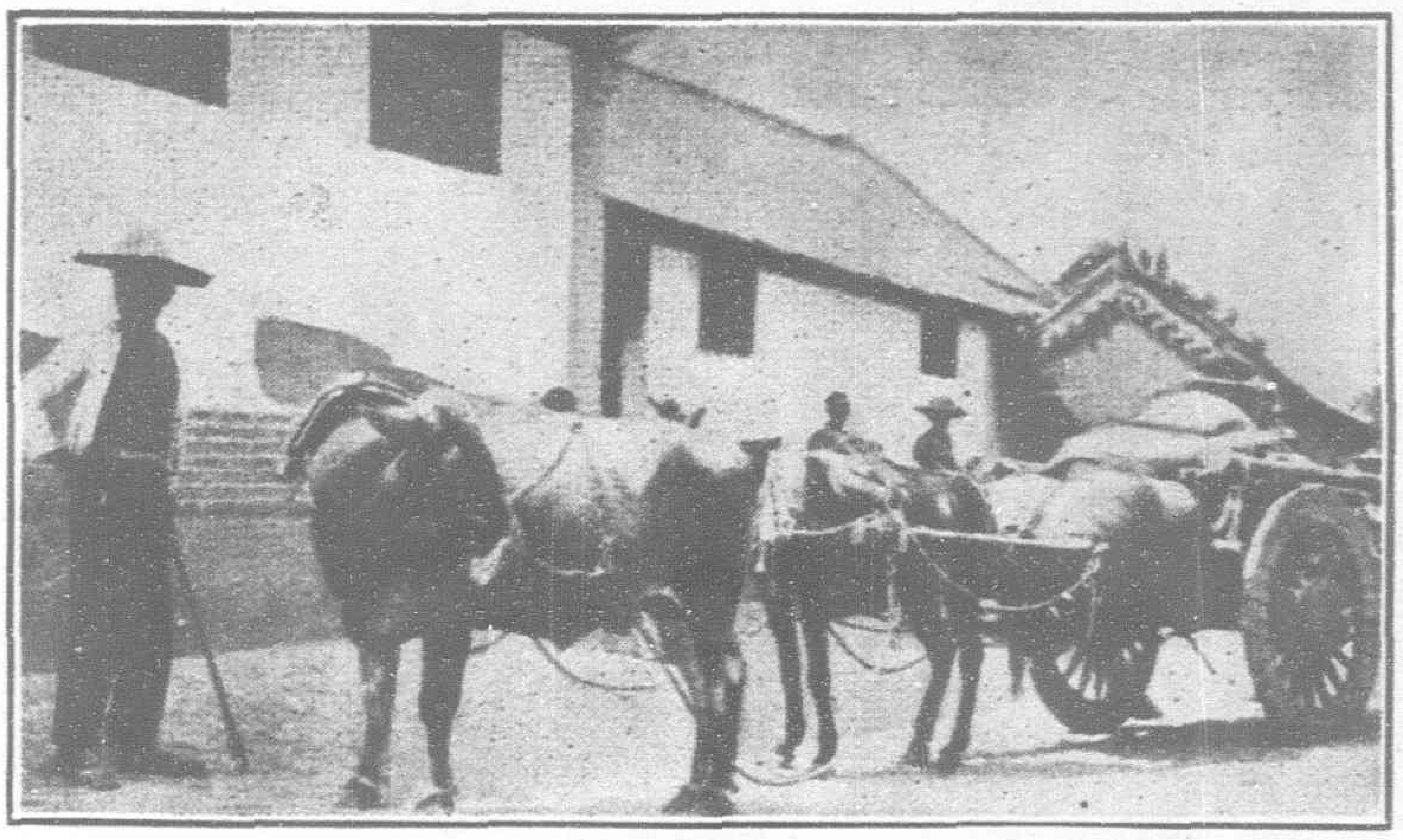
This development, and industrial development in general, of course, is far from being apace with the number of Chinese engineers being trained abroad. Mr. Yang, the head of the Chinese National Engineers and Manufacturing Company, estimates that of all the students educated as engineers in America and other countries, only about 50 per cent. of those specializing in electrical work can find employment upon returning to China. Eight per cent. of the civil engineers are able to find positions, while the number of Chinese chemical engineers is virtually nil, as there is practically no chemical industry.

Burden of Taxation

Reverting to the chances for the growth of the market for electrical goods, that, of course, would depend upon the general industrial future of China, but the present demand is still sufficient to justify expansion in the indigenous industry. The market suffered a severe slump during the early months of this year, but the leading manufacturers all assert that there are unmistakable signs of recovery. The great danger, however, in the offing, are the excise taxes of the Nationalist government, which will fall heavily on all local industries. In the minds of most observers, there is a tendency on the part of the Nanking Government, rather than protecting its infant industries, to levy heavy taxation burdens on the local manufacturing interests.

If a wise policy is pursued in this direction, and modifications are made in the tax schedule going into effect September 1, there is every prospect that the electrical industry as well as others will enjoy a continued expansion and prosperity, not only in supplanting a few of the lines that now are imported from abroad, but more particularly in developing products adapted for the peculiar Chinese market. Industrial expansion of this sort, to which there is no limit, would yield the Government far more ultimately than the short-sighted, throttling taxation policy upon which it seems to have embarked.

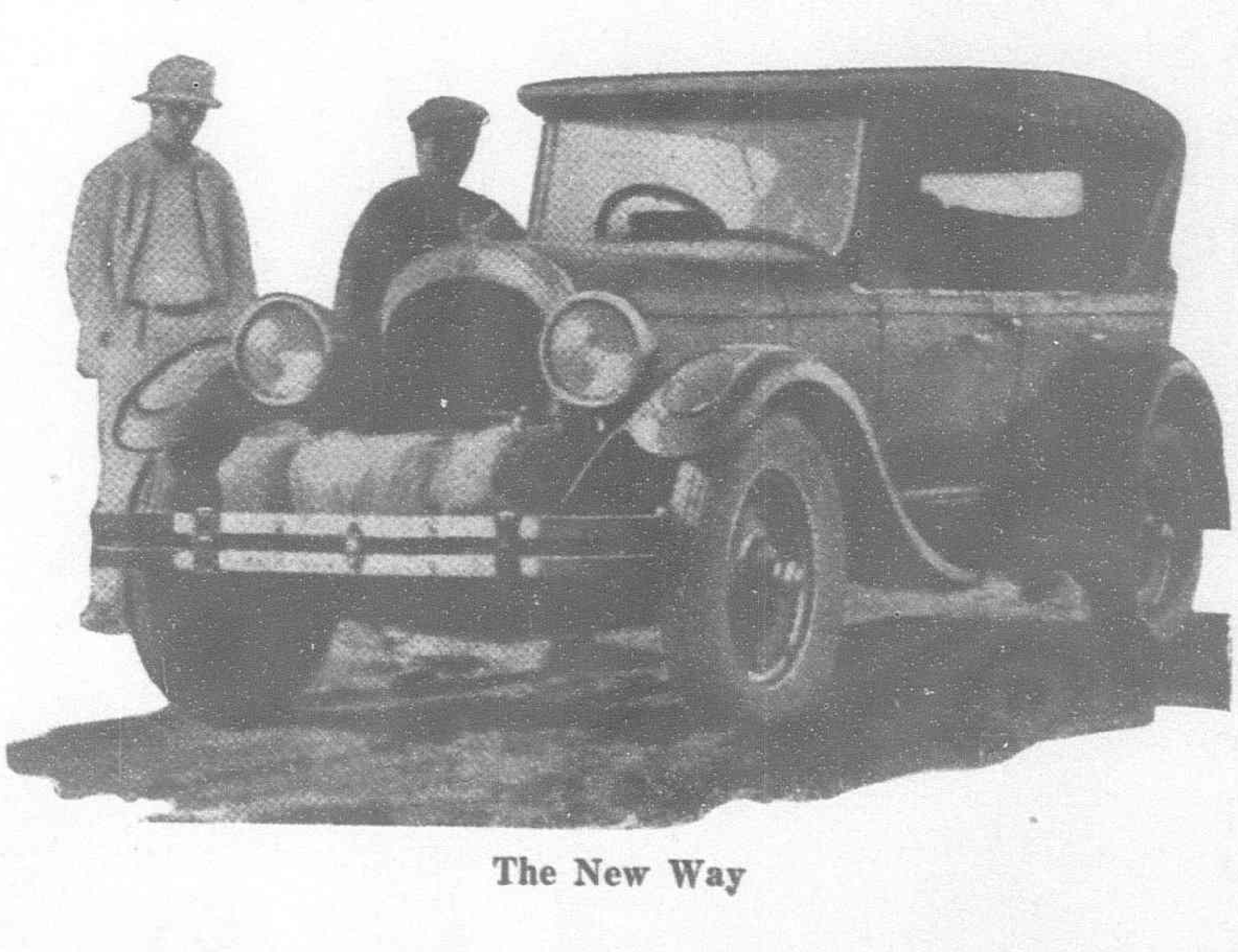
From Tsingtao to Chefoo



The Old Way

Chefoo lies south of the Gulf of Pichili, on the Shantung peninsula, where things, lively things, are happening just now. Though very densely populated, there are almost no roads. Mark L. Moody recently made record time in his Chrysler—the first automobile to traverse this part of China—through this human beehive from Tsingtao to Chefoo—" roads or no roads."

Strange contrasts, indeed ! Ox-carts, caravans of pack animals, coolie porters and automobiles all vying with each other for the right of way. Mr. Moody's chief equipment was a shoved and pickaxe which he used to reinforce places where the road had completely disappeared.



The New Way

Irrigation by Electric Power in Kiangsu

WATER-FIELD rice is the leading agricultural product of Changchow, Kiangsu province, and the rice fields depend on the Grand Canal for water supply. When water in the canal drops to the lowest level in dry seasons, these fields are over two *chang* above water level, causing much inconvenience and difficulty in irrigation. This has been a common cause of bad crops in recent years, as a result of droughts in spring and summer.

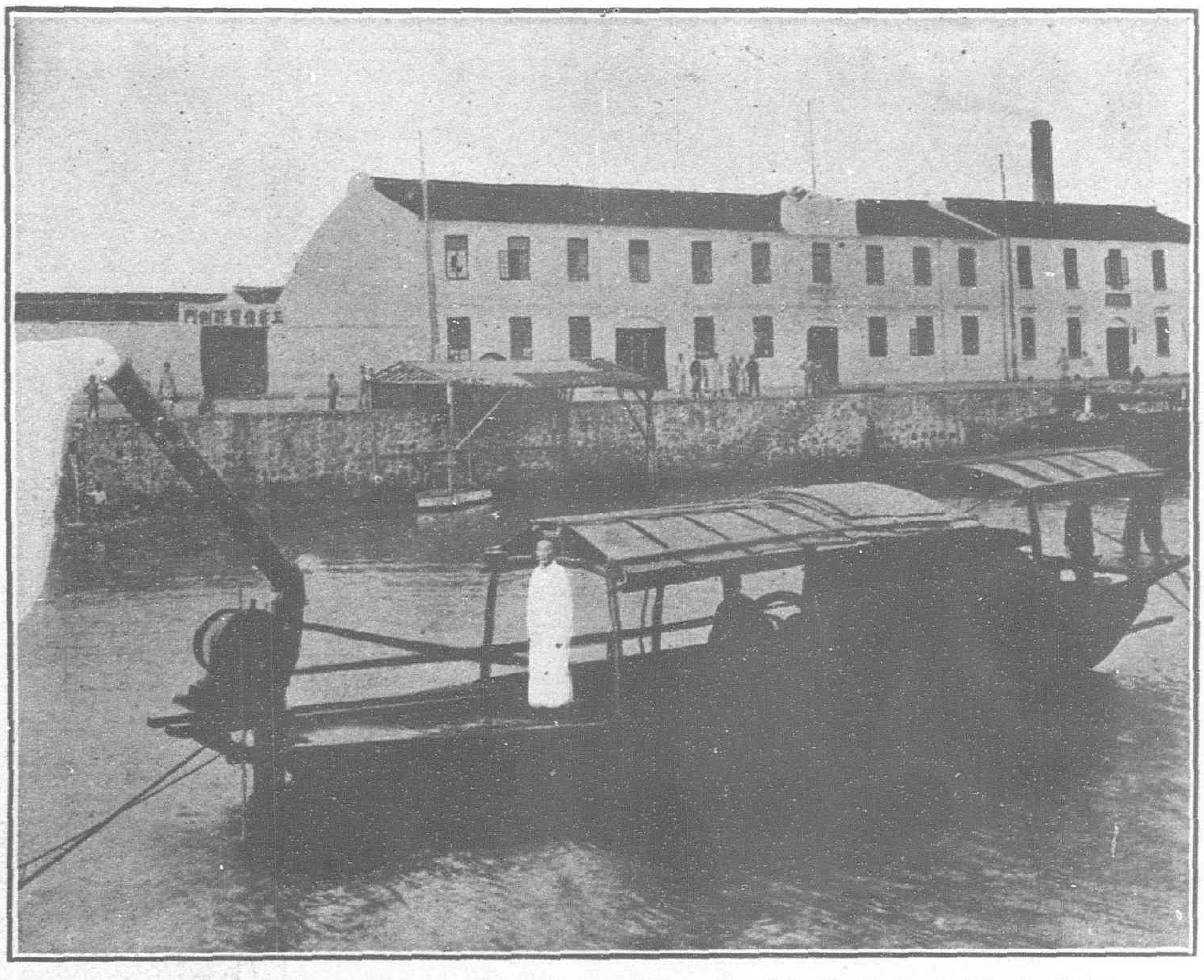
In the past, Changchow farmers relied entirely on human and animal power to get water for irrigation; later, oil engines were introduced, and saved much labor. The installation of one engine costs $300, which is sufficient for irrigating 1,000 *mow* of rice fields. But these engines are easily put out of order through carelessness in operation, and such an accident may delay the transplantation of seedling until too late.

In the spring of 1924, the local gentry of Changchow approached the Cheng Hwa Electric Power Supply Co., at Chishuyen, Changchow, with a request for a supply of electric power for irrigation purposes. The site of the Cheng Hwa Electric Power Supply Co., one of the largest in the country, covers an area of over four hundred *mow*, on the Grand Canal. It is equipped with two dynamos, each capable of generating 3,200 kilowatts of electricity of 3,200 volts. The transmission system installed by the company has been extended as far as Wusih in the east and Changchow in the west, the length of the wires of the trunk line being over 80 *li* and that of the branch lines in different directions over 120 *li*. Besides supplying electricity for lighting purposes in the city and suburbs of Wusih and a part of Changchow city, the Cheng Hwa Co., also provides electric power to many factories in the two cities. At present, there are five large factories and 57 small ones receiving electric current from the company, which produces on the average 2,800 kilowatts of electricity daily.

The installation of apparatus for irrigation by electric power in Changchow was initiated in the spring of 1924 as a result of negotiations between the Cheng Hwa Co. and the local gentry. Starting from Hutangkiao, outside the South Gate of Changchow city, poles were erected and wires stretched to Chaingwan and other places. Motors and pumps were first installed on three locations for experimental purposes, supplying water to about two thousand *mow*. The experiment proved highly successful and resulted in an excellent crop in the autumn. In the next spring (1926), many farmers in different parts of Changchow applied to the company for similar installations. In compliance with their request, the company began to erect additional poles and extended the wires to many places. In the meantime, agencies were organised in various villages to represent the farmers in signing contracts with the company for power supply at the rate of $1.70 per *mow* per season for direct supply (water pumped direct into the fields) and $1.20 per *mow* for indirect supply (water pumped into reservoirs for the use of the farmers), the motors, pumps, poles and wires being installed at the expense of the company. Early in that year (1925) electric irrigation outfits were installed at 12 places, supplying water to 9,700 *mow* of rice fields. Since 1925, more installations have been gradually added until there are at present 40 places in eight rural districts equipped with such labor-saving devices, supplying water to 38,234 *mow* of rice fields. The wires have now been extended to a length of 65 *li* and more than 1,000 poles have been erected; the total horse power is 984, producing 729 kilowatts of electricity.

Since 1926, the company has fixed a new schedule of rates. The use of electricity is now charged by the unit instead of by the *mow*. At a place where there are 1,000 *mow* of rice fields to irrigate, the company would set up poles and wires to the length of one *li* free of charge. In case the mowage does not reach 1,000 or the company has to extend the wires over one *li*, an extra charge will be made for poles and wires at the rate of $300 per *li*. The minimum charge on every *mow* is 10 units at six dollar cents per unit. The company also offers motors, pumps and meters for sale or rent to the consumer.

According to the record of 1925, the average number of units consumed per *mow* was 17, or $1.02, at 6 cents per unit. If used more economically, this number may be reduced to 14 or 15. Rent for motor and pumps and other miscellaneous expenses come to about $0.50, totalling $1.50 per *mow*, for the first year, and somewhat less for the following years.



Testing a Centrifugal Pump Manufactured by the Wusih Industrial Training Works and Used for Irrigation

For irrigating an area of 500 to 700 *mow*, a 10 h.p. motor and a 6 inch diameter pump are installed; for 800 to 1,200 *mow*, a 24 h.p. motor and a 10 inch diameter pump; and for 1,400 to 2,000 *mow*. a 32 h.p. motor and a 14 inch diameter pump. For irrigating an area exceeding 2,000 *mow* a reservoir should be provided, as direct irrigation can only cover an area of 1,200-1,300 *mow*. All motors used are the products of Siemens (China) Co., while the pumps are manufactured by the Wusih workshops.

Irrigation by electric power has proved to be highly beneficial to the Changchow farmers. For human labor, the farmer had to pay $0.50 per working day in addition to food and lodging. Contract labor costs the farmer $2.00 for irrigating a *mow* in the past and this does not include the water required after the transplantation of seedlings. When animal power was employed, the cost of food was even more expensive, as shown in the following table:

	Food Consumed by Each Cow per year	Food Consumed by Each Horse per year
Barley	8 piculs and 4 *tou*	14 piculs
Wheat bran	11 ,, ,, 8 ,,	13 ,, and 5 *tou*
Maize	2 ,, ,, 8 ,,	3 ,, ,, 9½ ,,
Hay	29 ,, ,, 70 catties	35 ,, ,, 50 catties
Straw	43 ,,	45 ,,
Salt	3 ,, ,, 3 *tou*	1 ,, ,, 8 *tou*
"Buried grass"	12 ,,	nil
Green grass	45½ piculs	38½ piculs
Waste vegetable	10 piculs and 60 catties	nil

In using oil engines for irrigation, the cost averages $1.90 per *mow*, which is also much higher than that for electric irrigation. In the latter case, water wheels are entirely dispensed with, as water is directly pumped into the fields. Even in the case of an indirect supply of water, only small water wheels controlled by one or two workers are used for drawing water from the reservoirs into the fields, while in the old-fashioned way 10 to 20 hands had to be employed for working a cumbersome wheels in day and night shifts.

The second advantage of electric irrigation to the farmer lies in the enhanced land value. Before the adoption of this new method of irrigation, the price of rice fields at Changchow was between $70 and $100, but it has since been raised to $120-$130 per *mow*, as the productive power of the fields has increased. In 1925, the yield of every *mow* not electrically irrigated was worth only about $10, as the shortage of water during the transplanting season often forced the farmer to grow beans instead of rice, while that of the fields irrigated by electric power was about $30. As there are about forty thousand *mow* thus irrigated at present, their extra yield of $20 per *mow* would total around $800,000 for the farmers.

Since the adoption of electric irrigation, surplus water is found around the fields through the year. It has been suggested that fish and water plants may be raised in the ponds to the further advantage of the farmers.

Between the Cheng Hwa Co. and the farmers there are agencies or agricultural associations, one in each rural district. These agencies act as the middlemen, selling electricity to the individual farmers according to the price fixed by the company who allows the agencies a 10 per cent. commission. In some case, the agencies receive no commission from the company, but they charge the consumer a higher price; for instance, they sell electricity at seven dollar cents per unit, while they pay the company at six dollar cents.

Railway Conference in Peking

ANY attempt to make a concrete plan for improving the chaotic railway situation in China by re-establishing order and system must necessarily cover a wide range of subjects. To re-instal the machinery for sound railway finance and efficient railway service requires general overhauling in the whole system. Under present political conditions, this overhauling can only be carried out by persistent efforts and enforced patience. To produce quick results at the same time to lay the foundation for further improvements, the most essential problems of efficiency of organization and economy of management must first be attended to. Furthermore, such a plan must closely follow the procedure of receivership of public utilities in which public interest as well as the interest of the creditors also demands, first of all, the preservation and operation of the property under strict exercise of economy. That these fundamental ideas guided the delegates to the recent railway conference in Peking (see the last *Bulletin*) in their deliberations is evident from a perusal of the subject-matter of the resolutions:

I.—Promotion of Traffic.

1. To abolish or reduce transit taxes.
2. To reduce freight rates on principal commodities by thorough investigation of traffic conditions with the co-operation of commercial organizations.
3. To take drastic action to put a stop to corrupt practices in the handling of traffic.
4. To take an inventory of all rolling stock.
5. To control and to pool all rolling stock according to the needs of the different lines.

II.—Repair and Inspection of Rolling Stock.

1. To hasten urgent repairs of locomotives and cars.
2. To enforce strict inspection of locomotives and cars and their proper maintenance.
3. To provide materials for urgent rolling stock repairs.

III.—Maintenance Works in Tracks, Bridges and Station Equipment.

1. To decide as to the urgency of the works.
2. To estimate amount of materials required.

IV.—Resumption of Through Traffic Facilities.

1. To exchange rolling stock at junction stations with temporary limitations.
2. To settle all through traffic balances with cash payments.
3. To investigate and promote the movement of through freight by seeking co-operation of shippers.
4. To control junction station reports.

V.—Military Detention of Rolling Stock and Military Transportation.

1. To demand return of all detained rolling stock not immediately required for military purposes.
2. To take an inventory of all rolling stock detained for military transportation.
3. To repair all defective rolling stock returned.
4. To strictly enforce the rules of miltiary requisition of rolling stock as laid down by the Military Transportation Headquarters.
5. All military transportation shall be handled by the Military Transportation Headquarters.
6. No military interference with railway operation (under this heading 14 kinds of military interference are enumerated).
7. To petition the Tayuanshuai to exempt the deficient railways from military contributions. (In fact, the Peking-Suiyuan, the Tientsin-Pukow and the Peking-Hankow Railways have not contributed any military subsidy since January).

VI.—Reduction of Expenditure, Budgetary Control and Publicity of Accounts.

1. To fix a definite limit to the number of railways officials and employees according to present requirements of actual work.
2. To weed out superfluous officials and employees according to the above limit of men required.
3. To reduce other operating expenses by a close analysis of the operating expense items.
4. To determine a formula of budget control according to minimum requirements, so that the meagre income of the deficient lines can be apportioned to meet the operating charges in the order according to the urgency of their nature, such as salary and wages, urgent repairs for rolling stock and maintenance of way, etc.

VII.—To Publish and to Submit to the Ministry Monthly Reports of Income and Expenditure by the Different Lines Whose Accounts shall be Frequently Audited by Auditors from the Ministry of Communications. Irregularities of Accounts shall Henceforth be Dealt with Strictly.

VIII.—Payment of Arrears of Salaries and Wages.

IX.—Proper Accounting System and Procedures to be Enforced.

1. To fix responsibility of Accounting officers.
2. To clear up the suspense accounts.

X.—Centralized Power of Control in the Appointment and Dismissal of Railway Officials.

XI.—Better Treatment of Railway Workmen.

1. To give preference to payment of wages regularly.
2. Regular shifts for work of Military duty and Additional pay for overtime.
3. Extension of co-operative stores for workmen.

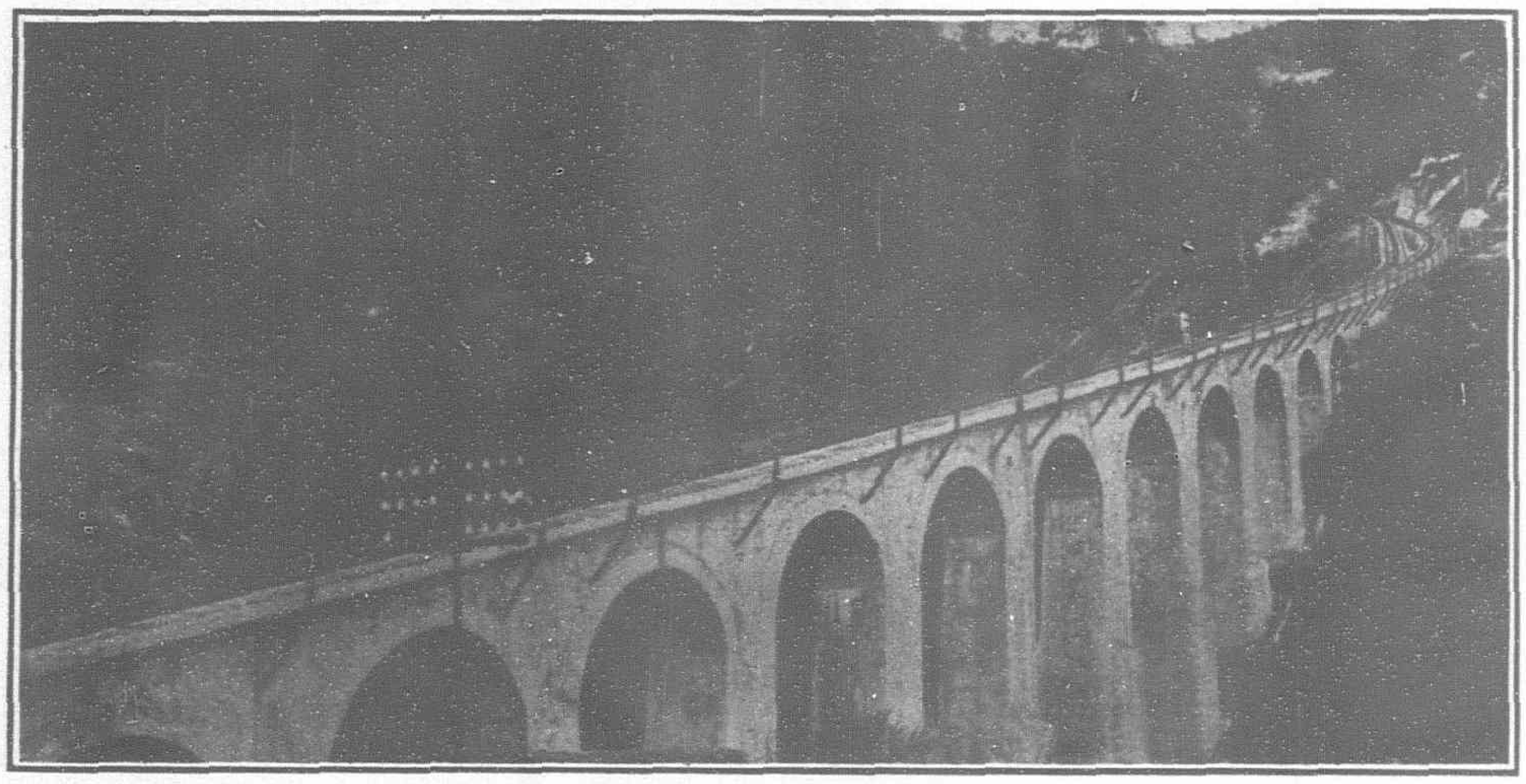
A special feature of the Conference was the summary report presented by the Ministry on the great mass of valuable information supplied by the various Chambers of Commerce, both foreign and Chinese, in Peking, Tientsin, Kalgan, etc., concerning the excessive transit taxes and corrupt practices of station masters. It was shown that the total transportation cost for a ton of wool from Paotow to Tientsin, including all the taxes and other illegal charges, is six times more than the freight between Tientsin and New York! A certain Chamber of Commerce informed the Conference that a station master maintains a profitable business by demanding extra charges for the use of cars according to a well-made tariff schedule of this own, $32 for a twenty-ton car, $38 for a thirty-ton car, etc. This valuable information will be placed before a Conference of Department Chiefs of the different lines for reference in the formulation of definite and detailed measures for enforcing the Conference decisions.

The above-mentioned Conference of Department Chiefs will be convened within the next two weeks to decide on detailed procedure for carrying out the policies laid down by the Directors' Conference. Important Ministry officials will be assigned to the different railways to help them carry out the program of reforms after the Conference of Department Chiefs has concluded.

The Penang Hills Railway

Construction Details of One of the Most Unique Railroads in the World

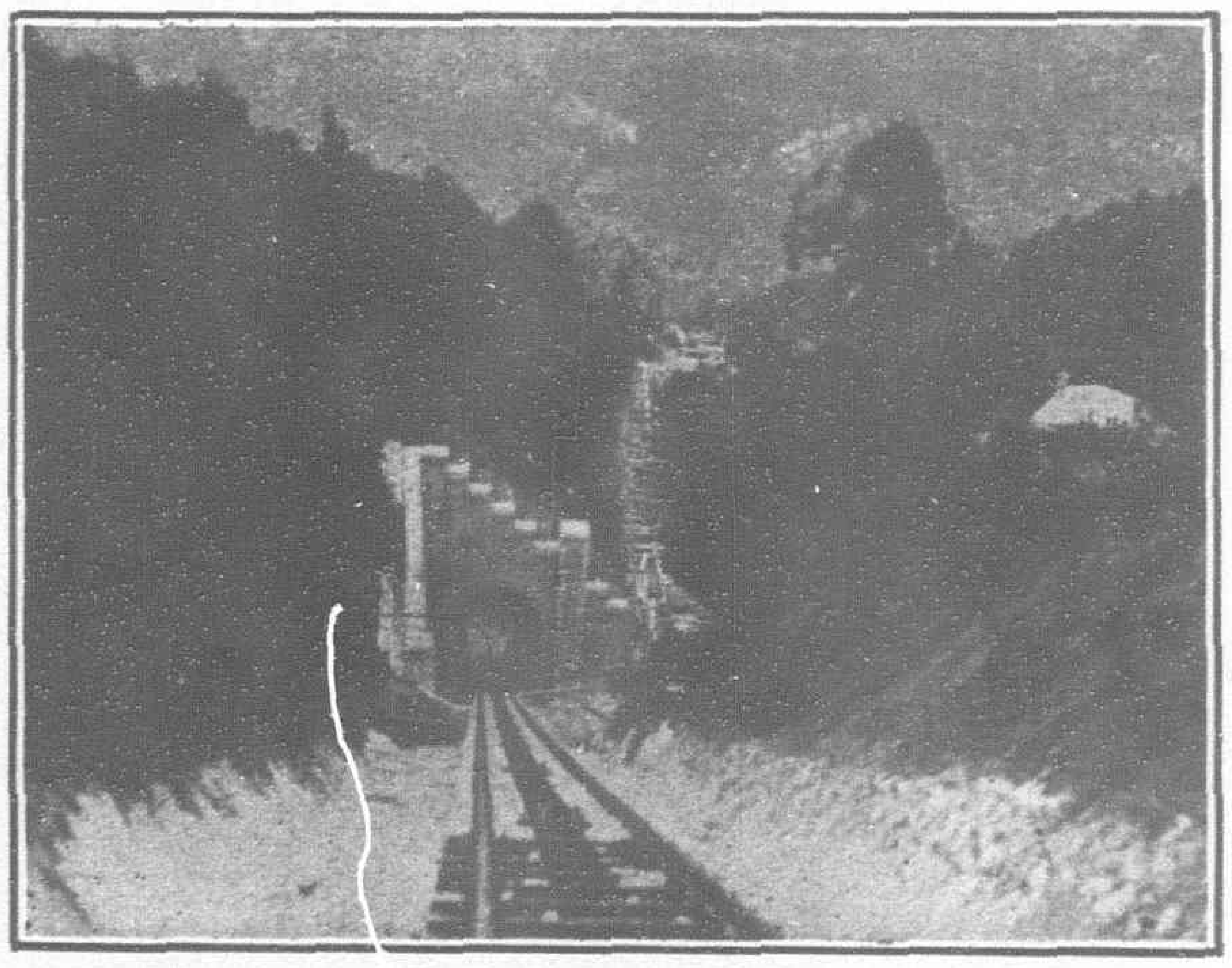
AFTER many delays, much adverse criticism and a history of failure over a quarter of a century ago, the Penang Hills Railway in the Straits Settlements has become a remarkable reality. It is a triumph of engineering skill and patient investigation of problems entirely different from those involved in ordinary line construction. It was found that the only type of railway capable of meeting the main conditions was a funicular railway on which very steep gradients can be adopted and a great height surmounted in a comparatively short distance.



Penang Hills Railway, Second Viaduct

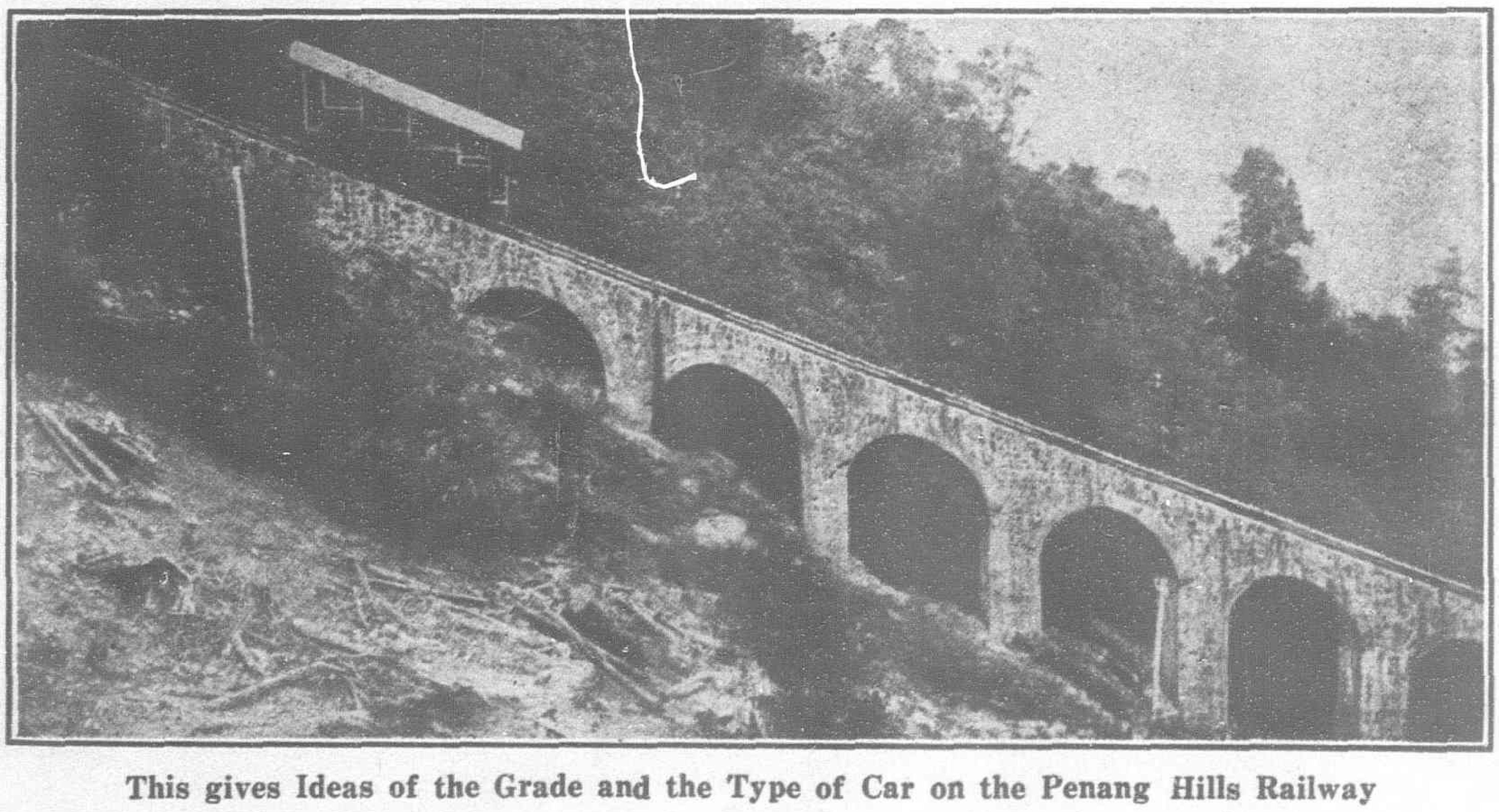
In a funicular railway there are two cars used which are connected by a haulage rope which is put into motion by a stationary engine, one car ascending while the other descends the line. After an extended survey of the Eastern portion of the Hill the most suitable site was decided on, but it was such as to necessitate the line being constructed in two separate sections. By this, proper relationship between the gradients would be maintained at a reasonable cost and carrying capacity.

The location being fixed it was next necessary to design a substructure which would withstand the destructive power of tropical storms. The construction adopted consists of a solid masonry be of granite built in cement throughout the whole length of the lined.



Penang Hills Railway, Upper-end Tunnel

Owing to the extreme irregularity of the slopes of the Hill it was necesary to construct alternating cuttings and viaducts throughout. There are 11 viaducts, the longest 775 feet long and 50 feet high at its highest point. The total lengh to the viaducts is nearly half a mile. In addition to these works there is a tunnel 258 feet long near the top of the line. It is one of the steepest in the world and for the greater part of its length is constructed through granite.



This gives Ideas of the Grade and the Type of Car on the Penang Hills Railway

The Railway, as mentioned, is divided into two sections and may for all purposes of operating be considered as two distinct and independent lines, the top section being a complete duplicate of the lower section insofar as the electrical equipment, telephone and signalling systems are concerned. The braking system and methods of protection are very thorough and practically every possible source of trouble has been anticipated and overcome.

The main engines which haul the cars up the line are situated at the top of each section and are each provided with two driving sheaves around which the haulage rope is wound. The sheaves of one engine weigh about 17 tons and are fixed on steel shafts 11½-in. in diameter. They are driven by a 75 h.p. motor running at 300 revolutions per minute. Each engine is provided with four brakes, three of which come into operation automatically in the event of any failure in the proper working of the engine. The haulage ropes are of a special construction to ensure a minimum of wear. They are 1¼ inches in diameter, weigh about 11-lbs. per yard and have a breaking strength of 75 tons. Two of them would lift a modern main line locomotive. The maximum load to which they are subjected is about 5 to ns ore on-fifteenth of their breaking strength.

By this railroad visitors to Penang can enjoy in perfect safety one of the most remarkable journeys possible. The average speed is about 4 miles per hour and the cars mount through scenery of the wildest description to a height of 2,381 feet above sea level. Wonderful panoramas are unfolded first of seas of cocoanut palm then of the eastern side of the Island with the town of Penang and finally of the distant prospect over all and across the channel to the Malayan Peninsular, Province Wellesley and the Perak mountains.

Tea Cutting and Blending Machinery

IN developing the tea industry in China, nothing is more important than the utilization of automatic tea cutting and blending machinery. China should have been the principal tea-producing country in the world, but a constant disinclination to use modern methods has proved a tremendous handicap in the development of this industry.

In other countries the producers of tea have found that it is necessary to produce finer blends of tea by the constant improvement of cutting and blending machinery.

Consequently, manufacturers of tea machinery have made great advances in developing and improving the various types of machines. In this connection, the name Bartlett is a household word amongst tea merchants, since Bartlett Tea Machinery is used almost universally. Bartlett Tea Machinery is now manufactured by the well-known firm—Messrs. Henry Pooley & Son Limited, John Bright Street, Birmingham—who have introduced many improvements in the already famous Bartlett models.

The design and construction of the present day tea mills and tea blenders have so many points of excellence that those who have a plant in use are warm in its praise. The firm who are now manufacturing this tea machinery are too well-known for sound and efficient engineering work for any description of their workmanship and general qualities to be necessary. Their tea machinery manufactures can be roughly divided into two parts—Tea Milling and Sifting Machines, and Tea Blending Machines.

One of the first essentials of an efficient tea blender is that it should produce an efficient and consistent blend, in the shortest possible time, without damaging the leaf.

The vital factor in the construction of a tea blender is the arrangement of the vanes of baffle plates inside the drum. Messrs. Bartlett have devoted very many years to the study of this point, and it is entirely owing to the excellent scientific arrangement of these vanes that their blenders have such a high efficiency. Too much stress cannot be laid on the importance of this point. At one time the required number of revolutions for a proper blend could be unnecessarily increased by the carelessness or inadvertence of the attendant. This is now avoided by fitting the blenders with a patent timing gear which automatically stops the blender as soon as the drum has revolved the predetermined number of times.

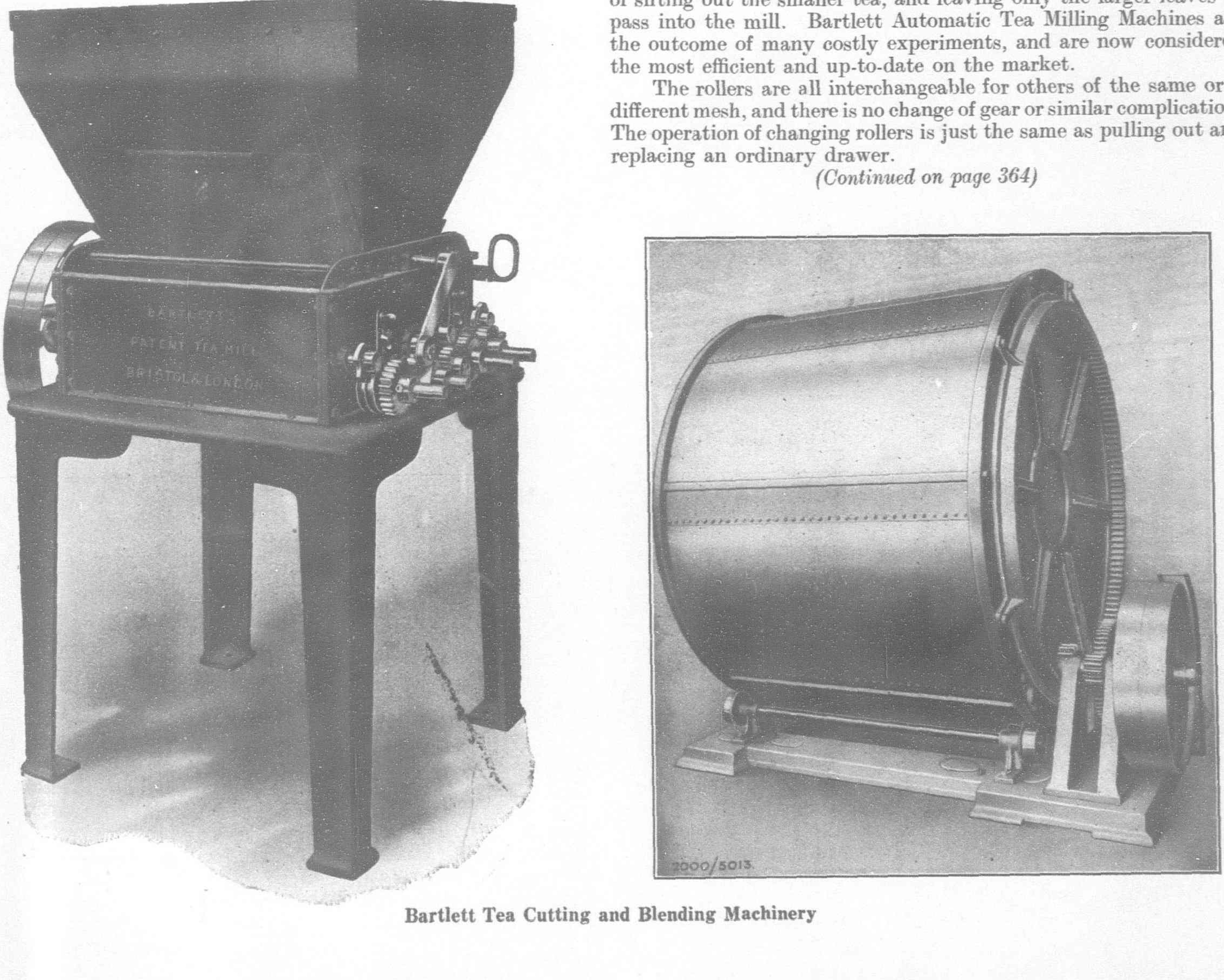
The discharge lever is also connected with the driving gear so that the cylinder revolves only when actually discharging its contents. By means of this arrangement the entire process is carried through with all possible speed and with the minimum amount of friction to the leaf. These blenders can be fitted with an arrangement for extracting the fine dust or bloom which the process of blending unavoidably sets free. The result of this addition is that the tea has a much brighter and cleaner appearance than would otherwise be possible.

A further recent improvement of great importance is an arrangement whereby the feed door can be operated by moving a handle on the side of the drum. The advantage of this over the old method of having to climb up and shut the door by hand, is obvious. The large sized blenders can now be supplied with a worm wheel drive and the size of the friction rollers on which the drum revolves is increased. These two improvements provide for very much smoother running, a factor which directly affects the blend.

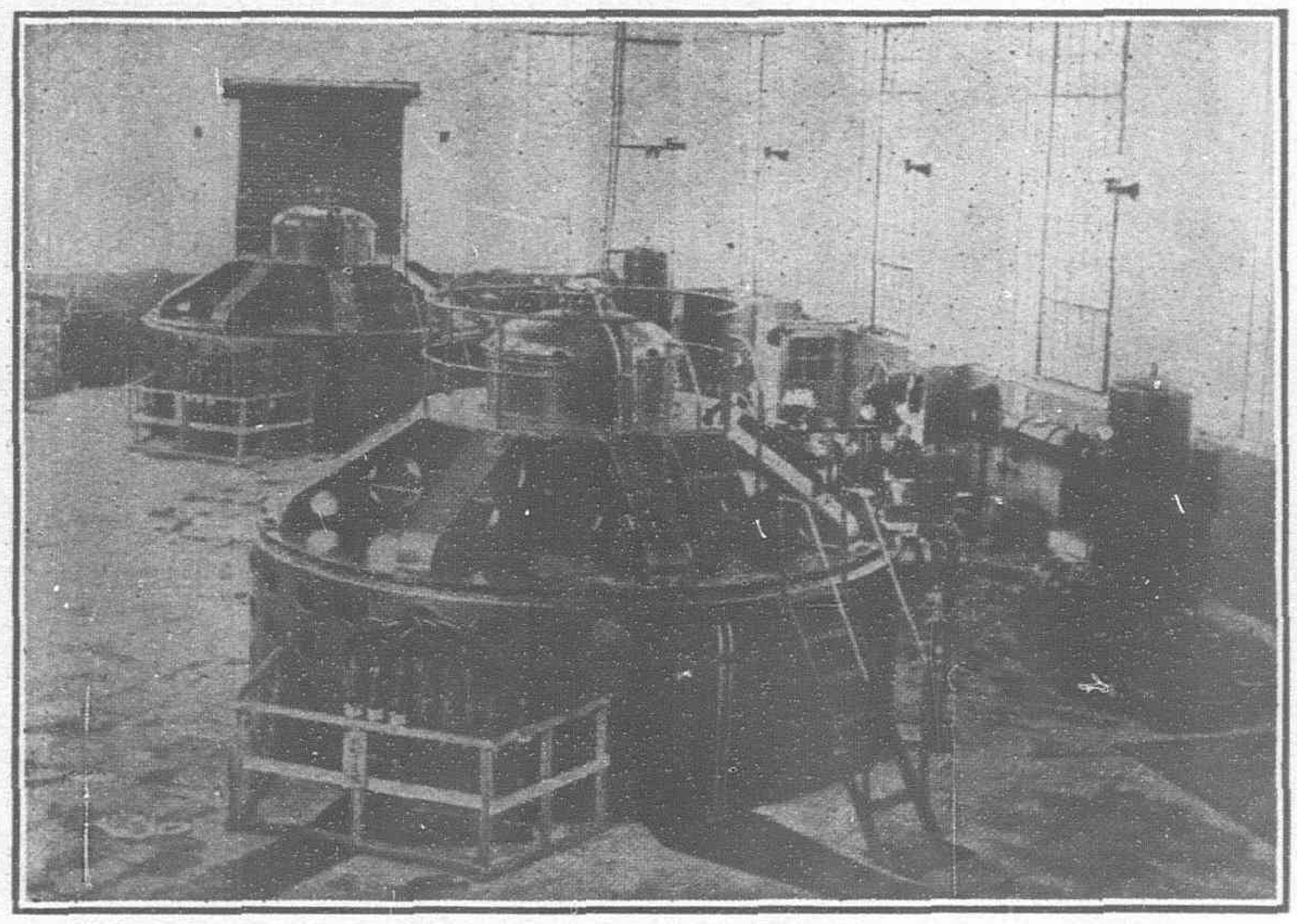
The automatic Tea Milling and Sifting Machines are designed to provide an even and uniform tea which is obtained by a process of sifting out the smaller tea, and leaving only the larger leaves to pass into the mill. Bartlett Automatic Tea Milling Machines are the outcome of many costly experiments, and are now considered the most efficient and up-to-date on the market.

The rollers are all interchangeable for others of the same or a different mesh, and there is no change of gear or similar complication. The operation of changing rollers is just the same as pulling out and replacing an ordinary drawer.

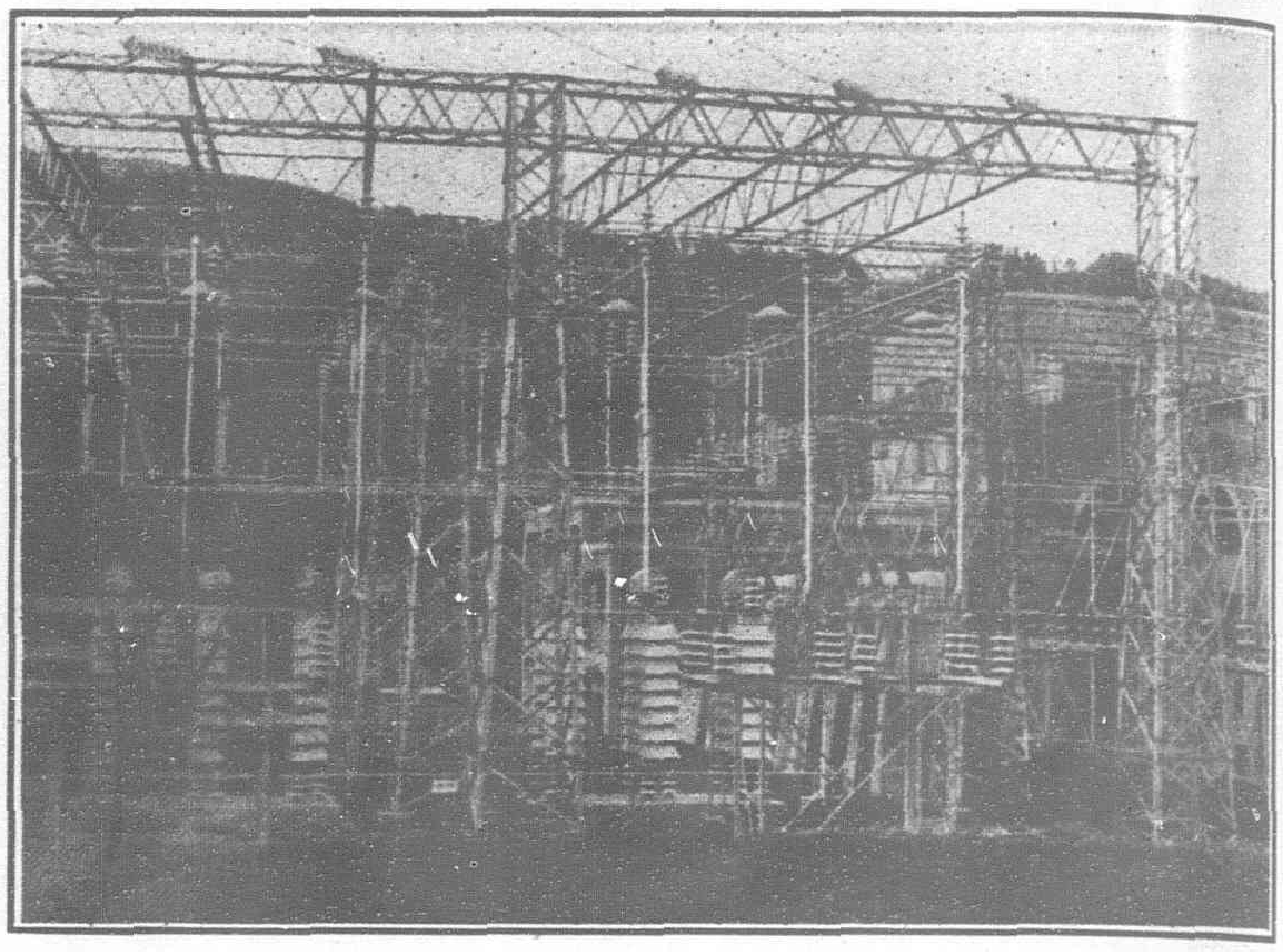
(Continued on page 364)



Bartlett Tea Cutting and Blending Machinery



9,000 KV-A., 6,600-Volt, 3-Phase, 60-Cycle, 150 R.P.M. Generators of the Ochiai Hydro-Electric Station



Outdoor Switching Station with Oxide Film Lighting Arresters, Ochiai

Ochiai Power Plant

The Most Recent of Seven Stations of the Daido Power Company, Japan

SEVEN times in its downward course from the mountains to the sea, the River Kiso falls in succession upon the turbine wheels of the Daido Denryoku Kaisha. At each successive drop the power of falling water is transformed into marketable energy—extracted, transmitted and utilized as if it were a commodity like coal or a mineral deposit.

The most recently inaugurated hydro-electric plant of this series is the Ochiai station at Umehira in Gifu Prefecture which is centrally located in Japan, and within distribution distance of her important cities and markets for industrial power. The great Daido Electric Power Company develops upwards of 160,000 kilowatts which is fed into the industries of Japan, contributing to the prosperity of that country. Its president, and the active leader of its many diversified enterprises is Mr. Momosuke Fukuzawa, upon whom the degree of Doctor of Science was conferred by Union College, one of America's oldest institutions of learning, at the time of his visit to the United States in 1924.

The newest of these stations feeds the Osaka and Nagoya districts. The city of Osaka is known as the Manchester of Japan.

The dam and power station required two years for construction at a cost of two and a half million dollars. The reservoir has a capacity of 55,000,000 cu. ft., and supplies 3,000 cu. ft. per second at an effective head of 72.6-ft. The length of the dam at the top is 710-ft., and the height from base to top of the highest pier is 102-ft. The overflow dam is provided with 18 discharge spillways, each 25-ft. wide and 20-ft. deep, and a 15-h.p. motor operates each gate. An emergency equipment of gasoline engines supplements the gate motors.

The intake is 135-ft. long, 94-ft. wide, and 48-ft. high, provided with an iron refuse guard and equipped with six water control gates, 13 by 20-ft., operated by 25-h.p. motors, which are located 23-ft. above the water level. At the bottom of the open flume there is a depression from 5 to 10-ft. in depth to catch sand and gravel. There are two penstocks, 12-ft. 9-in. in diameter, each equipped with a surge tank, 100-ft. high and 30-ft. in diameter, built of reinforced concrete.

The power house has two main generators rated 9,000 kv-a., 80 per cent. power-factor, 6,600 volts, 3-phase, 60 cycles, 150 r.p.m., revolving field type made by the General Electric Company, U.S.A. These are driven by 12,000-h.p. Boving turbines of the vertical reaction type. Two other turbines of the same make, 350 h.p. each, drive exciters of 240 kw., one of these units being kept as a reserve.

The main transformers are of the core type, single-phase, 60 cycles, 6,000 kv-a., which step the voltage up from 6,600 to 80,850, 77,000, 73,150 delta-delta connection. These were built by the Shibaura Engineering Works. House transformers, three operating and one reserve, are rated 175 kv-a., 6,600-3,300 volts, and also three operating and one reserve of 100 kv-a., 3,300-220/110 volts.

Tea Cutting and Blending Machinery

(Continued from page 363)

Bartlett Rollers are constructed with sloping cells and are considered to be the most efficient on the market. The sloping cell possesses a great advantage over the usual straight cell, because with the latter the leaf has a tendency to fall in end up, and thus be inaccurately cut. The sloping cell guides the leaf in correctly with the result that a more uniform cut of tea is obtained. The Mills can be fitted with examination trays, and are usually supplied with the feed hoppers.

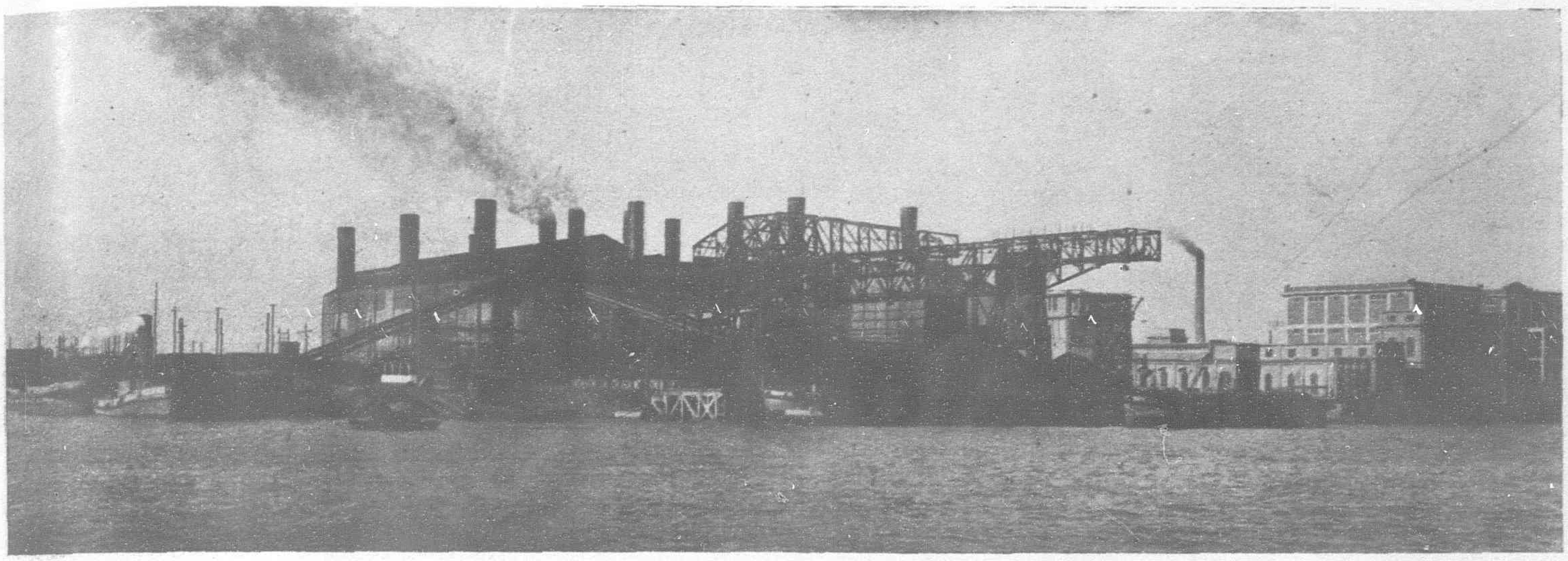
A very important and essential accessory is the Bartlett Electric Magnetic Nail Extractor which is fitted to the majority of these mills. This apparatus effectually extracts all metallic substances passing through the feeding hopper before the tea fall on to the mill. The range of Tea Mills now manufactured by Messrs. Henry Pooley & Son Limited is very wide, varying from small two 12-in. roller mills up to their latest production in the shape of a large 16 roller machine. This large machine is a very fine example of efficiency, and an engineering feat worthy of the name of its maker.

Large Electrical Contract Placed

By The Mukden Electric Light Works

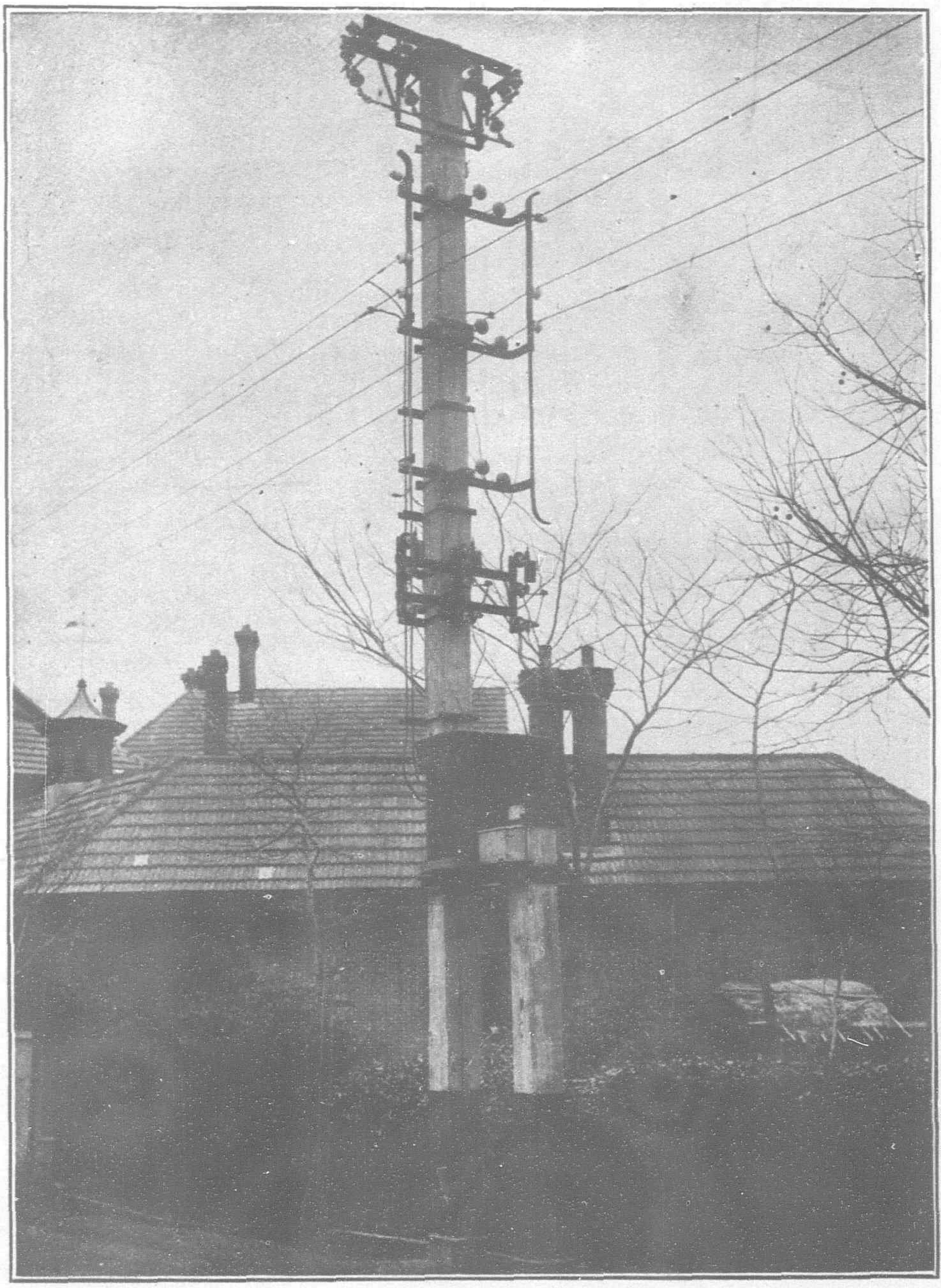
The Mukden Electric Light Works have just placed an order for a 5,000 k.w. extension to their present plant with Messrs. Andersen, Meyer & Co., Ltd. This business was competed for by practically all large electrical manufacturers of various nationalities. The value of the contract is approximately Mex. $1,000,000.00.

The main items of the plant consists of turbine manufactured by the General Electric Co. of U.S.A., condensing equipment by the Worthington Pump & Machinery Corporation, U.S.A., and boilers by the Heine Boiler Co., St. Louis, U.S.A.



Riverside Power Station—View from Whangpoo River

Shanghai's Electricity Department



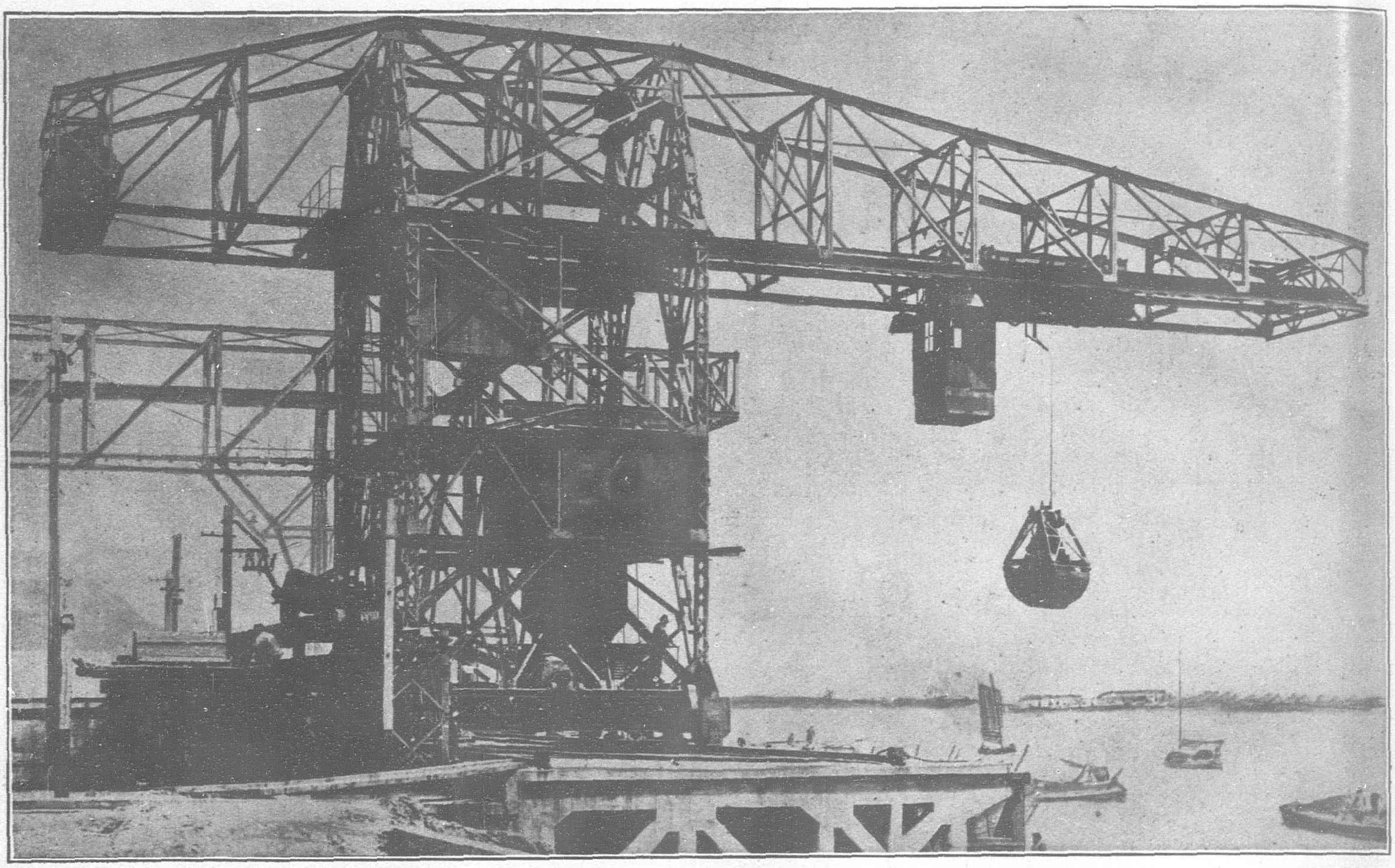
Pole Transformer Reducing Pressure from 6,600-Volts to 200-Volts for Distribution in Lightly Loaded Area

THE brightest spot in Shanghai's Municipal administration is the Electricity Department. If there was any industrial depression in the year 1926 in Shanghai the report for the year of the Electricity Department shows no evidence of it. In the year 1924 the Electricity Department sold 333,877,088 units, in 1926 it sold 444,412,352 units—an increase of one-third during a period of two years which, in the popular conception, were supposed to be years of bad business.

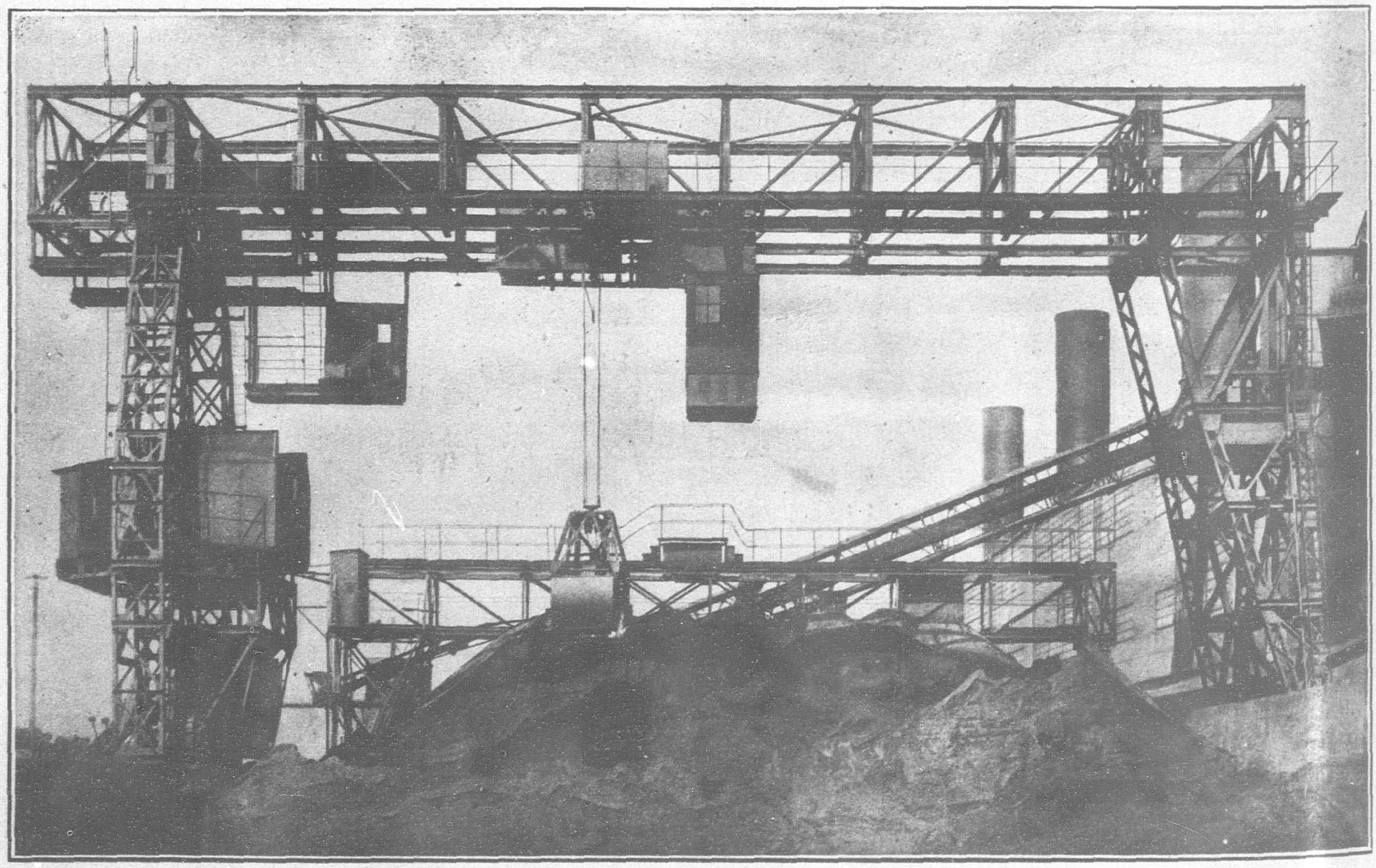
The graphs of the progress of the electrical undertaking show year by year an increasingly satisfactory curve. The only temporary exception was in the year 1925, the year of the May 30 incident. It will be remembered that for a period of several months the great Riverside plant was kept in operation, in the heat of summer, without the aid of a single Chinese. For a considerable period even the Chinese mills were supplied with power. When the Municipality eventually decided to shut off the power from Chinese undertakings many of them put in private power plants so as to keep part of their works running. Some of these were somewhat slow in returning to the use of Municipal power, even after they had the opportunity, but in the meantime it has been demonstrated to them that no private plant can at all compete with the Municipal Electricity Department in supplying power.

In the course of his annual report, T. H. U. Aldridge, engineer-in-chief and manager, says: "It is indeed gratifying to be able to record a net increase of 13,922 h. p. in motors. It seemed in the early months of the year 1926 that local conditions and the state of trade in China generally would considerably curtail the activities of industrial concerns taking supply from the Department's mains. This fortunately has not been the case, as results have shown. Furthermore it clearly indicates that the industrialist is inclined and even anxious to locate mills or factories within the area served by the Department."

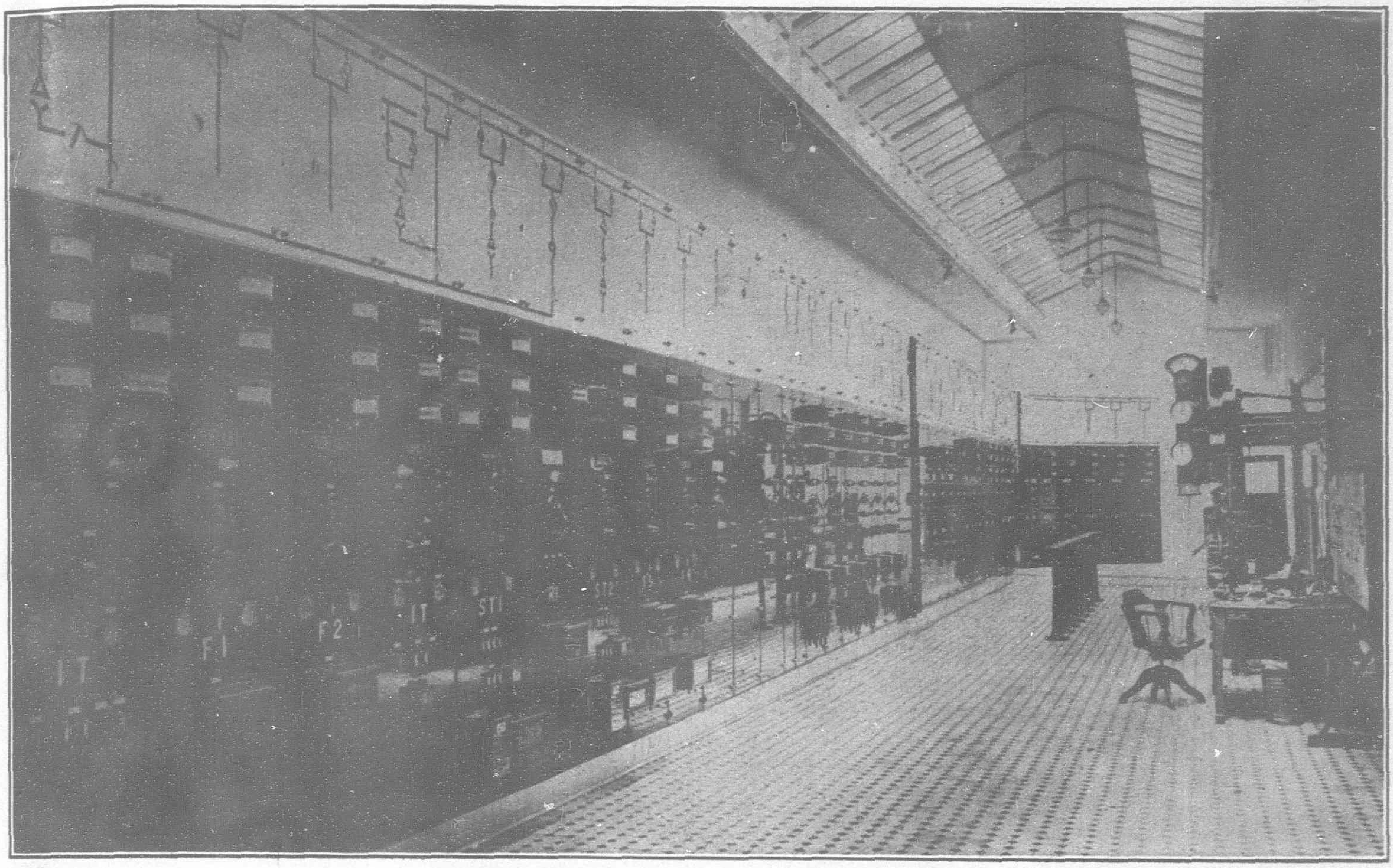
It has been the fate of many Municipal undertakings to have been badly mismanaged, rather supporting the old saying that "what is everybody's business is nobody's business." But the public has still to hear of any criticism of the



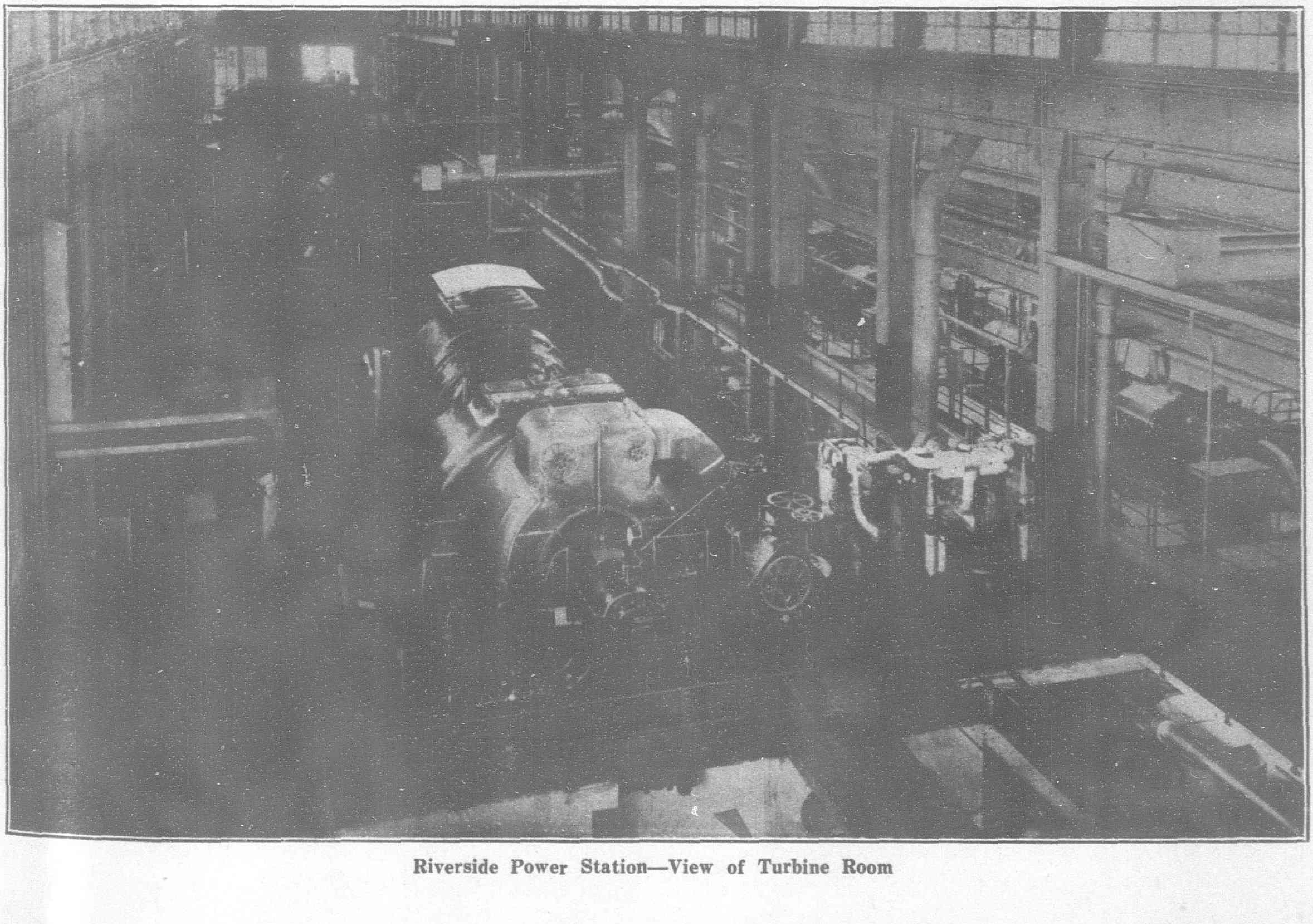
Riverside Power Station—View of Mitchell Coaling Plant—Quay Transporter



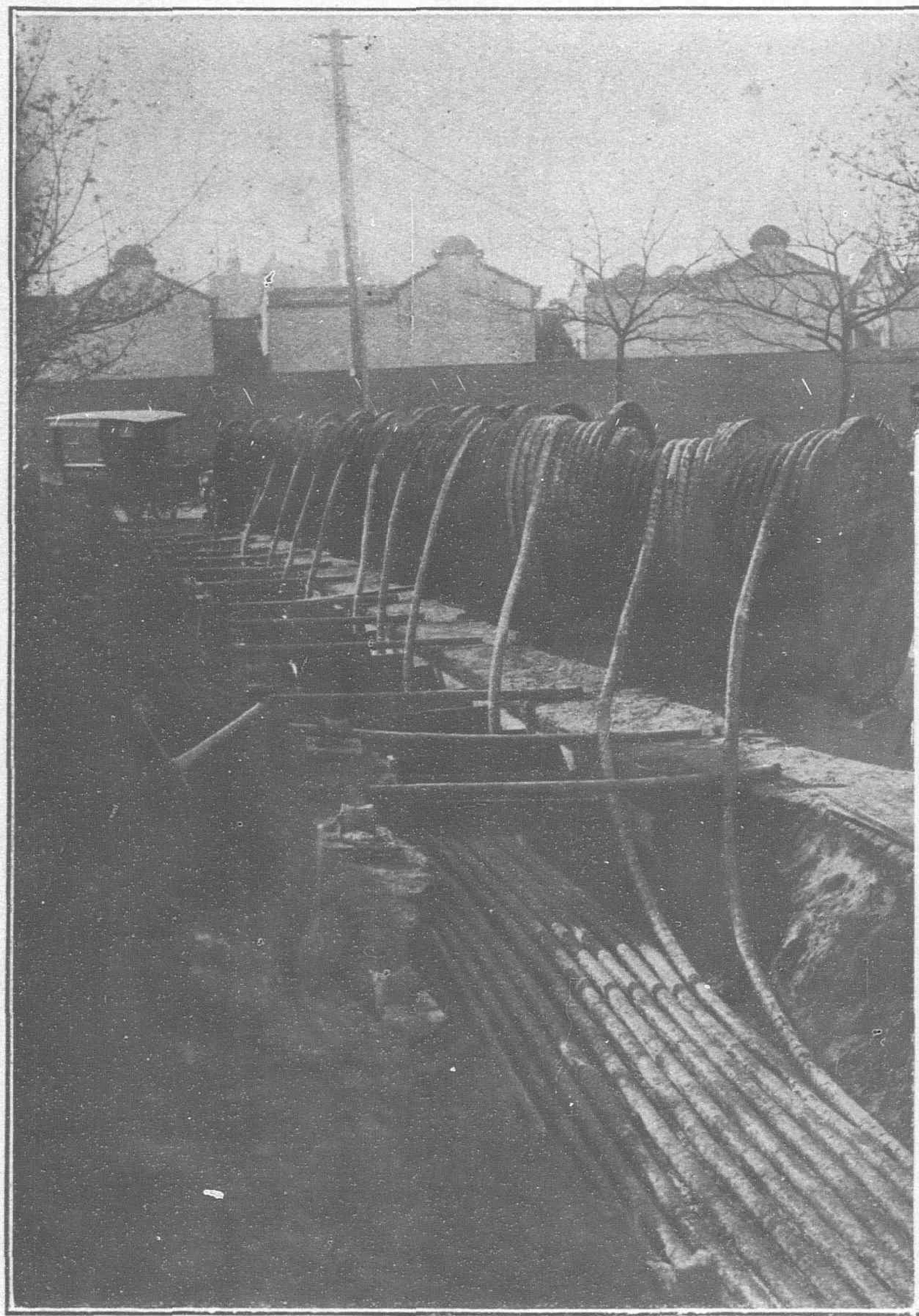
Riverside Power Station—View of Coal Reclaiming Transporter

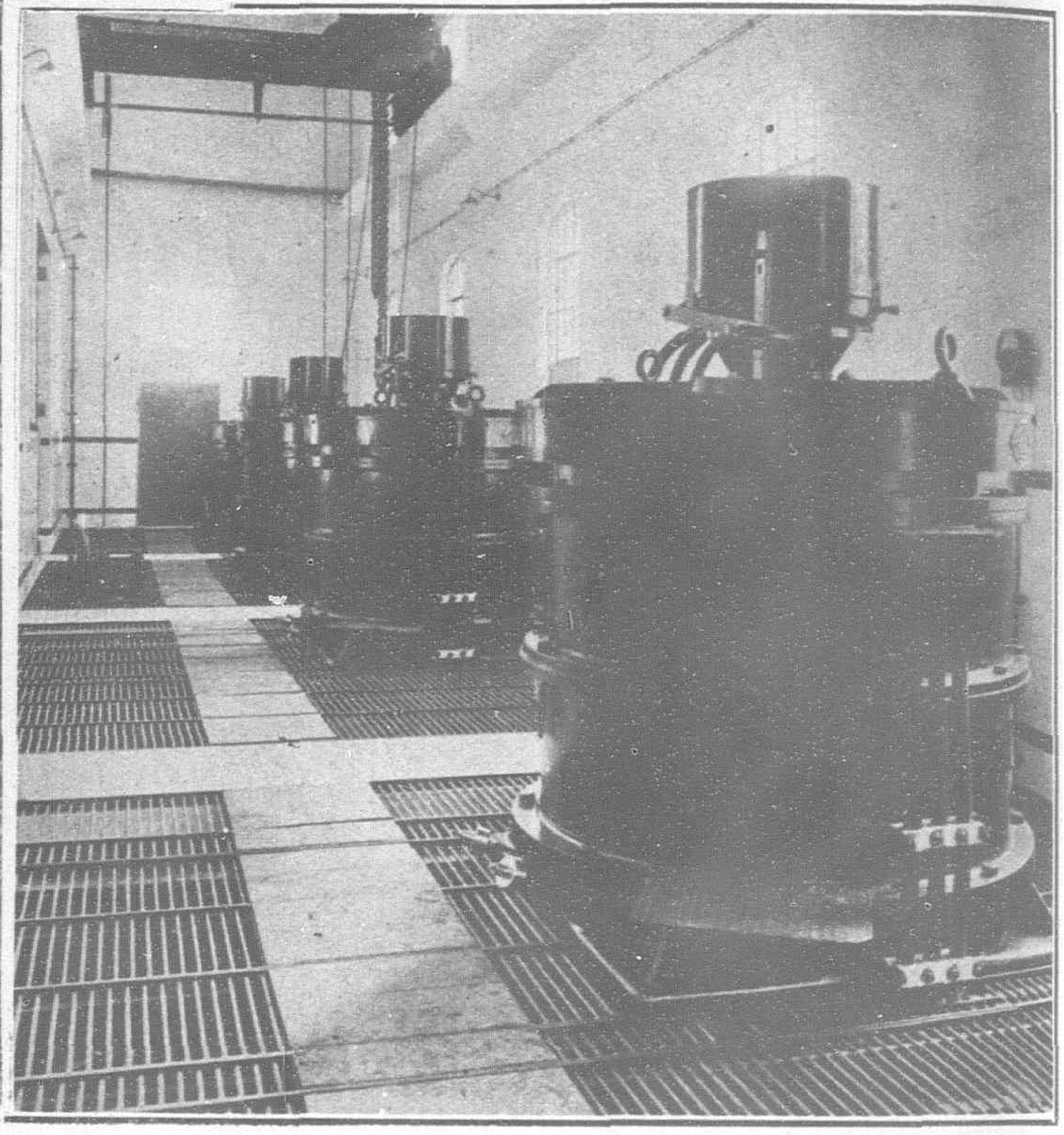


Riverside Power Station—View of Control Room



Riverside Power Station—View of Turbine Room

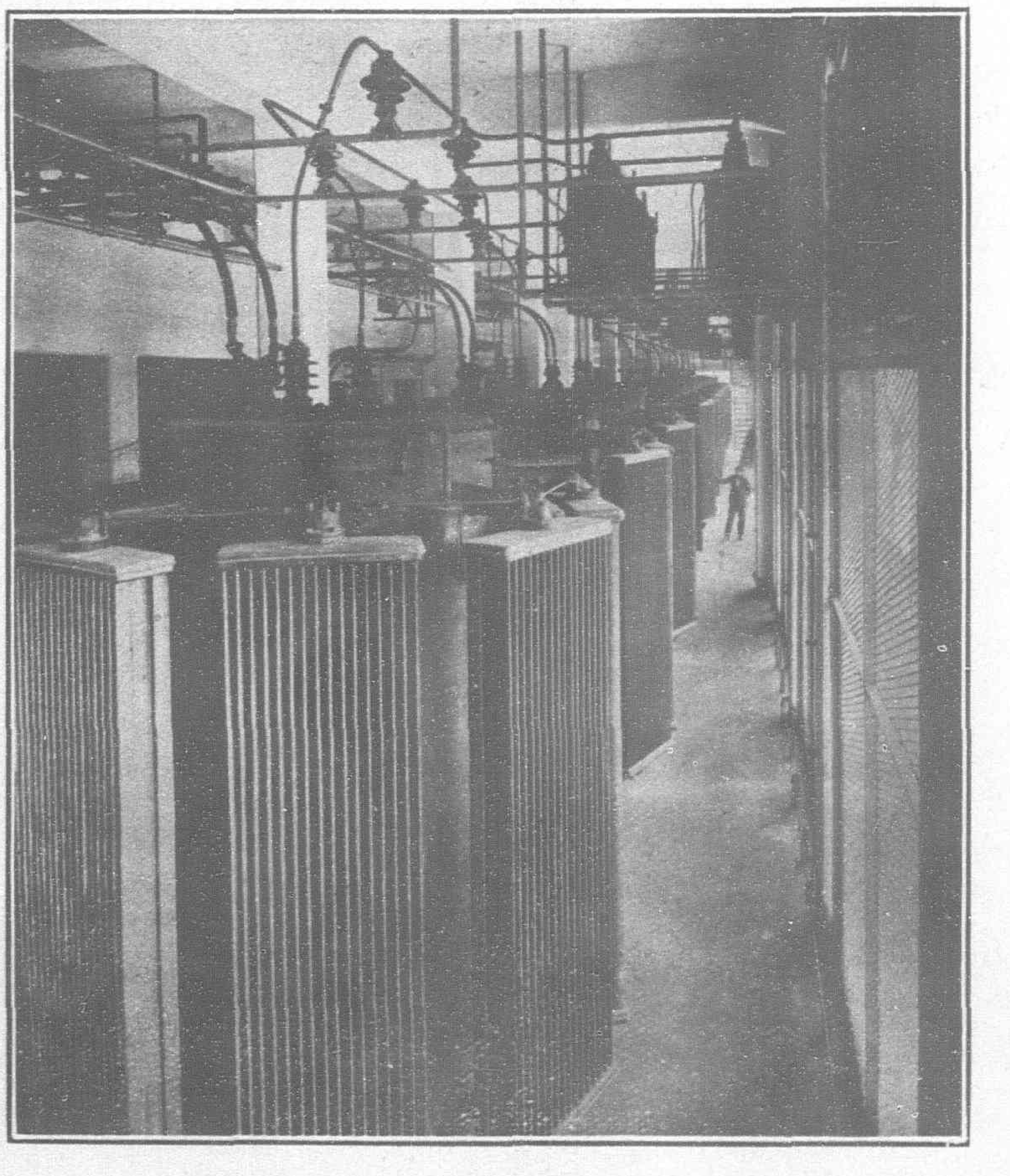




Left.—Laying 6,600-Volts Underground Armoured Cables in Whashing Road.

Right.—Riverside Power Station—View of Circulating Water Pump House.

Bottom.—Ground Floor of Tonquin Road Sub-station Showing the 4,200-K.V.A. Transformers for stepping down from 22,000-Volts to 6,600-Volts. Total Capacity=37,800 K.V.A.



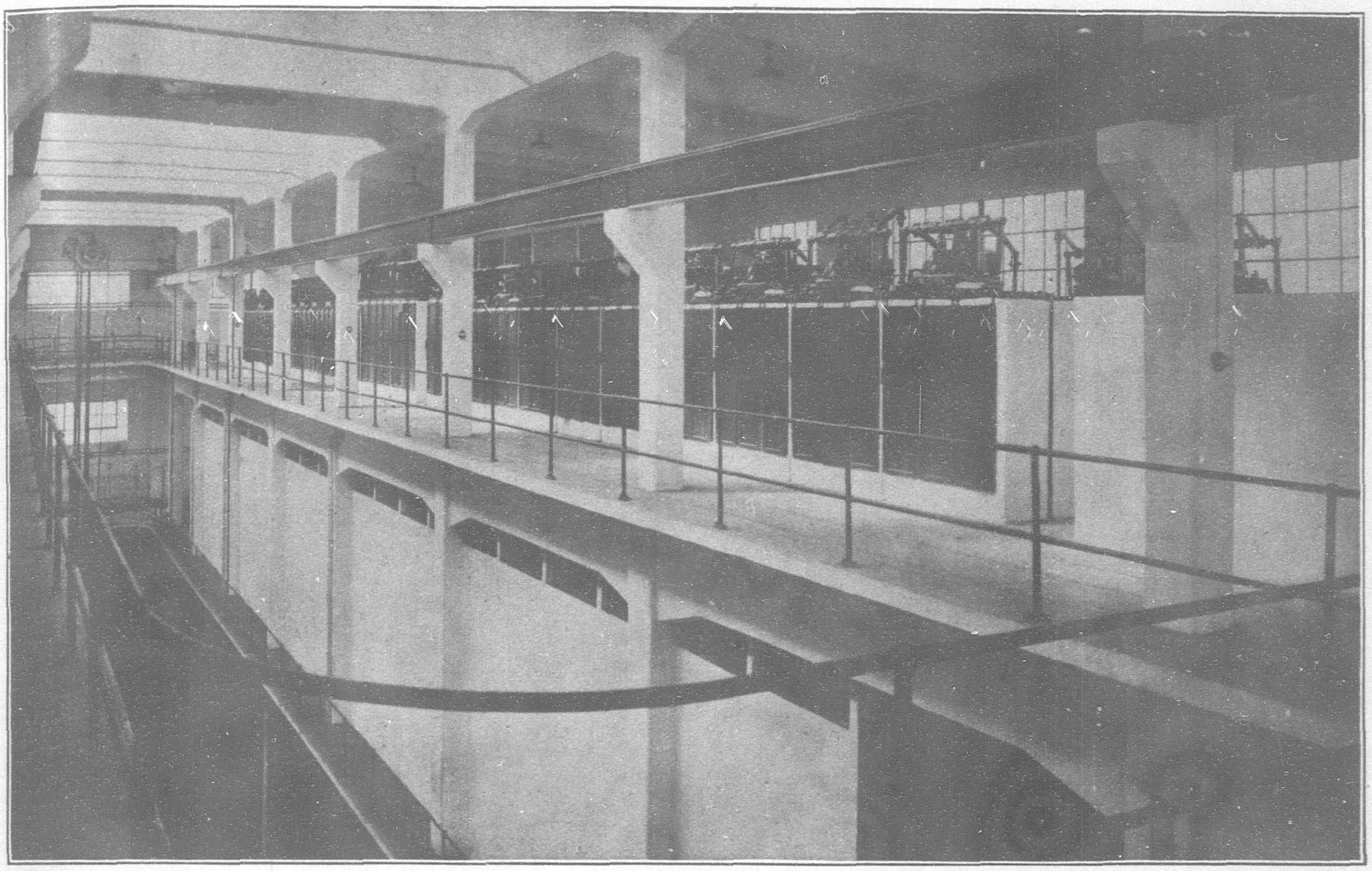
management of the Shanghai Electricity Department. There are few concerns in the world that can point to such an excellent record. Where is there another electricity works that can show a load factor of 61.79 per cent ? Last year's report shows a return on capital outlay of 12.31 per cent., which is probably above the average of results produced by private undertakings, although the Shanghai electricity works are run not mainly for profit, but with the idea of supplying cheap power to industrial concerns and thus contributing to the development of Shanghai as a port.

As illustrative of the policy of the Department in this respect it may be stated that the charge for lighting averages about seven times as much as that for power, and the net result is that 89 per cent. of the total number of units is sold for power purposes.

With a view to popularizing electricity for heating and cooking purposes a special rate of three tael cents (less than two cents gold) has been made for these purposes, and apparatus is supplied by the Municipality on hire at nominal rates. The result, so far, has not been phenomenal, but 19,345 kilowatts were connected as at 31st. December, 1926, under this head, an increase of almost six thousand kilowatt-hours over the previous year.

When one comes to examine the financing of this huge undertaking one sees how carefully it has to be handled. One almost shudders, in these times of crisis, to learn, as one does from a footnote of the balance sheet that there are contingent liabilities for the supply of plant, etc., amounting to approximately a million taels. However up until this time Shanghai has always been able to raise whatever money it needed at reasonable rates of interest. If the money needed during the current year will be forthcoming, despite the outlook, well and good.

The capital of Shanghai's electric installation, or rather the outlay, comes to roughly thirty-two million taels, say twenty million gold dollars—quite a respectable sized institution even in these days of great undertakings in the United States. Of this sum



Top Floor of Fearon Road Sub-station Showing Electrically Operated, 22,000-Volts Switchgear

more than twenty-one million taels represents borrowed money. The loans outstanding, to use the exact figures, total Tls. 21,301,307.73.

The financing of the Electricity Department has become almost a bigger thing than all the rest of the municipality of Shanghai. The revenue collected by the Electricity Department last year was more than ten million taels. In other words the Electricity Department collected as much money from its customers last year as the Municipal Council did from the occupiers of houses as ratepayers, from the land taxes, licenses and all other forms of taxable revenue. The Department contributed from its profits last year Tls. 1,200,000 to the Municipal funds.

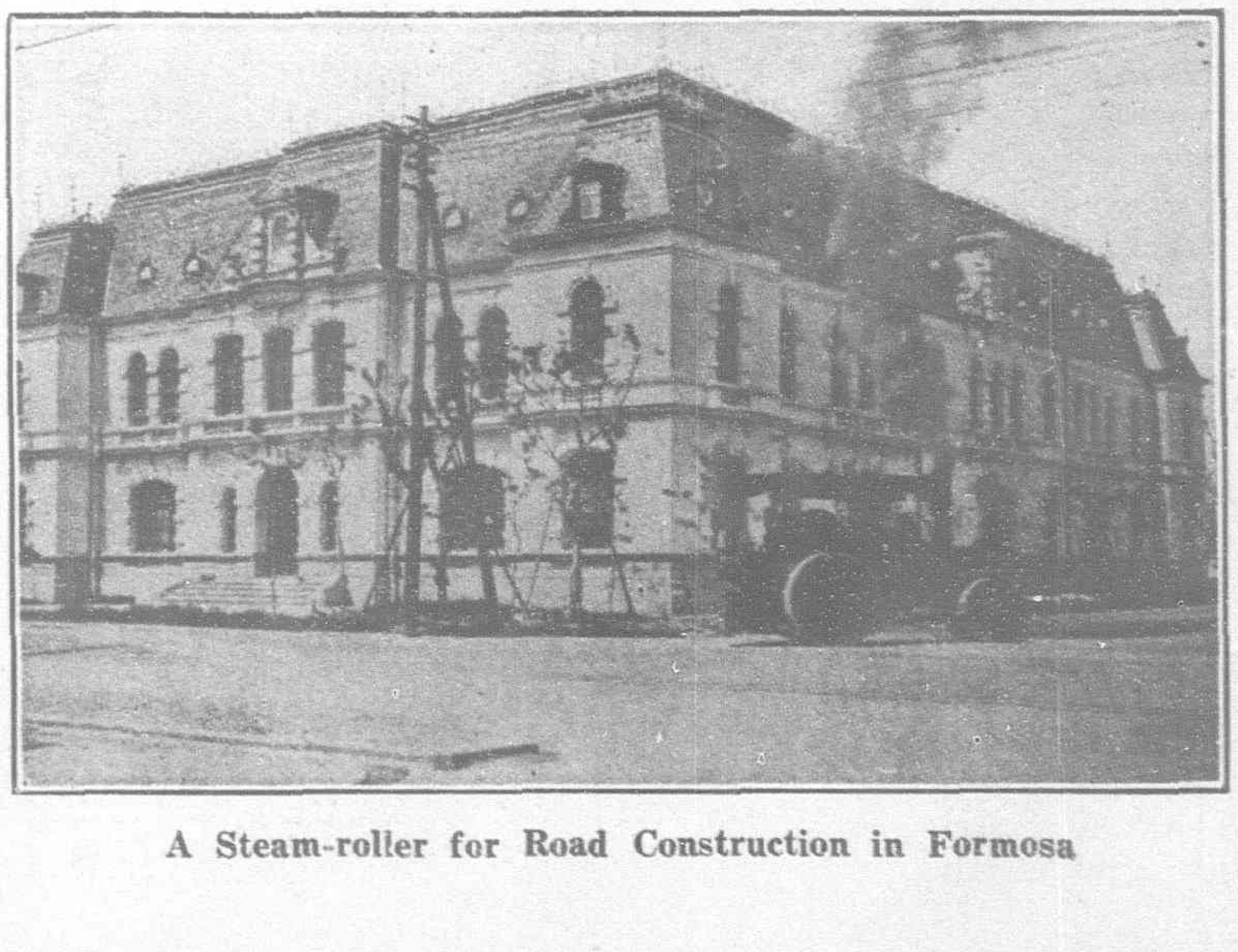
When the time eventually comes that the Chinese to take over Shanghai, they will fall heir to a wonderful institution in the Electricity Department. It is a possibility that the Chinese may operate Shanghai as a municipality, if not as efficiently as it has been maintained so far at least as economically, considering benefits received per dollar paid in taxes. But what will they do with the Electricity Department, for there they will have a problem that requires not only the highest technical skill, but the best of management, and expert financing ?

If all three of these requisites are not met, there is great danger of the institution being wrecked.

Road Construction in Taiwan

TAIWAN'S budget for the fiscal year beginning April 1, 1926, provided for appropriations totaling Y.12,810,000, to cover a 10-year period of bridge, culvert, and aqueduct construction in connection with the building of a 287-mile principal highway along the west side of the island, from Keelung on the extreme north coast to Heito in the extreme south. The current fiscal year's allotment from this fund was Y.1,107,797, and that for the fiscal year beginning April 1, 1927, is fixed at Y.1,120,000. The projected new budget provides for a substantial enlargement of appropriations for highway construction.

Abutting landowners are charged with the granting of the highway's right of way to the width of 48 feet throughout the route, except in the mountainous sections, where a 36-foot minimum will be allowed. The expense of the actual road building will be borne by the governments of the Provinces of Taihoku, Shinchiku, Taichu, Tainan, and Takao, through which the highway extends ; the appropriations by the Taiwan Government General will be utilized only for the construction of bridges, culverts, embankments, and similar work. For building the roadbed or for surfacing the road, the use of brick, concrete, asphalt, tarvia, or other special materials is not contemplated.



A Steam-roller for Road Construction in Formosa

China's Minerals

By William H. Scheifley

THERE are two erroneous popular conceptions of China's mineral resources. According to the one, the Celestial Empire is a country without minerals, being even obliged to import gold and silver for monetary purposes. According to the other, China abounds in most of the useful and precious minerals, only the superstitious convictions of her people having prevented their development. Although there is truth in both these extremes, yet both are perhaps equally far from the facts, especially if we except a few minerals which have not been found in China. Thus there remains a considerable medium ground, making it possible for the Chinese to possess mineral resources well worth considering. Indeed, save for this fact, the western nations would have been less eager to secure concessions in the Celestial Empire.

True, the Chinaman is pre-eminently a tiller of the soil. Brought up in the Confucian cult of simplicity and frugality, he inclines to regard the exploitation of mineral riches as something verging on theft. Accordingly, if ores cropped out at the surface in his country, they belonged to the sovereign. But China's rulers utilized copper especially for coinage purposes, a fact attested by the monetary vogue of this metal in the Celestial Empire throughout forty-five centuries. As for salt and iron, these were government monopolies long before the Christian era; and Chinese history records many edicts against the creation of private metallurgical enterprises, the last having been in 1850.

So, despite China's valuable mineral resources, the meager development of her mining establishments should occasion no surprise. Nor in this respect has the government particularly favored its own citizens. To be sure, in mining matters as in those regarding railways, commerce and industry, foreigners have been held in check by means of rigid restrictions and a formidable administrative inertia.

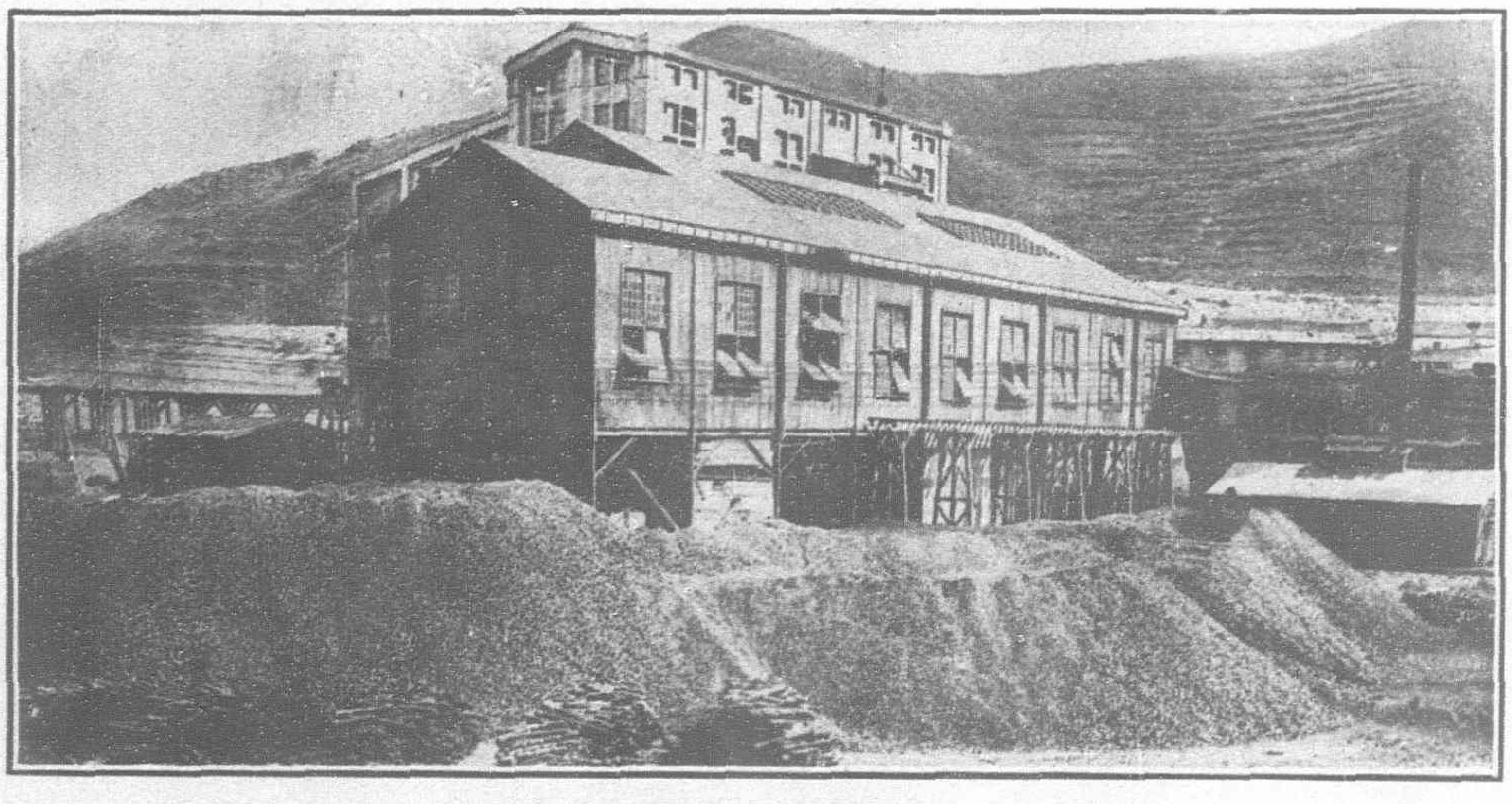
Notwithstanding such unfavorable conditions, a few mining concessions were granted to foreigners in the years prior to the Boxer disorders of 1900. Similarly, some native enterprises were created. But nowhere did results fulfill expectations. As if to crown disappointment, the Chinese government issued in 1914 a complicated mining decree, which the foreign ambassadors at Peking refused to accept but which China has never consented to modify substantially in their favor.

Coal in Abundance

At present China's most important mineral is unquestionably coal. Although iron is fairly plentiful, the industry has made little progress, due especially to the dispersion of deposits and unsettled political conditions. So far as may be judged by explorations, China is relatively poor in copper, lead and zinc. The same holds, of silver, extensively used as money. But on the other hand no country can compete with her to advantage in the antimony and tungsten markets. Well known are the rich tin deposits in the province of Yunnan. Very promising, too, are China's resources in bismuth and manganese.

The chief coal-producing centers are situated in the northeastern provinces of Chihli, Manchuria and Shantung. The yearly output of the first two amounts to some six million tons each and Shantung produces about two million. Hard coal is found mainly in Shansi and Honan to the west and southwest of Shantung. Though the cost of extraction does not come high, there is a long distance between the mines and centers of consumption, a handicap aggravated both by inadequate transport facilities and by present political disorders. Small wonder that anthracite coal should cost $35 or $40 a ton at Shanghai. China's coal output, which totaled 14,000,000 tons in 1913, had by 1924 expanded to 25,000,000 tons. Approximately 40 per cent. is furnished by two foreign companies, each sharing about equally.

The logical complement of coal is iron. Such ore, embedded in quartz, is found abundantly in southern Manchuria. It is mined notably by the Japanese company that runs the southern Manchurian railway. Whether such companies be purely Chinese or jointly Chinese and Japanese, 60 per cent. of the ore is shipped to Japan, a fact which leaves only 40 per cent. for utilization at home.



Penchihu Coal Mine

Ancient Copper Mines

The history of copper in China might almost be identified with the history of the celestial empire's money. Deposits of the metal were always sought with eagerness, though only to be abandoned after a short period of exploitation, owing to lack of scientific equipment. The copper mines best known to-day, or at least the most promising, are those in Yunnan and in Szechwan, provinces in the western part of the country. Surprisingly enough, China's present copper output is even inferior to that of the eighteenth century. Whereas at that earlier time it totaled 6,000 tons a year, to-day the yield amounts to scarcely eight hundred tons annually. Private enterprises have existed only since the revolution of 1912. Experts affirm that most of China's abandoned copper mines would give good returns if they were worked with up-to-date machinery.

As for zinc and lead, many deposits are known in China, though all are relatively unimportant. The best are situated in the southern provinces of Hunan and Yunnan. Those in Hunan worked since 1911, have since doubled their yearly output of zinc, bringing the figure to 20,000 tons, with half as much lead. So far as known, silver deposits are insignificant. China's production of this precious metal for 1916 was estimated at a little more than one ton; indeed, it has never exceeded fifteen tons in a year, Nor is the Chinese production of gold really larger, since that for 1916 attained only four tons, a figure which has latterly decreased. The best exploitations are those which treat the auriferous sands in the north. To be sure, important gold deposits are known to exist in the Altai mountains and in Mongolia, but they must await stable political conditions.

Antimony is found the most plentifully in Hunan, though the deposits farther south and west, in Kwangsi, are also excellent. China's annual production of this metal has increased from three tons in 1908 to 18,000 in 1925, or 50 per cent. of the world's output. On the contrary, her production of tin shows a decline, the figures for 1917 and 1924 being, respectively, 11,000 and 6,500 tons.

Leads in Tungsten

Within the last decade China has become the world's chief

(Continued on page 374.)

The Shanghai-Nanking Railway at Nanking

Communications in China*

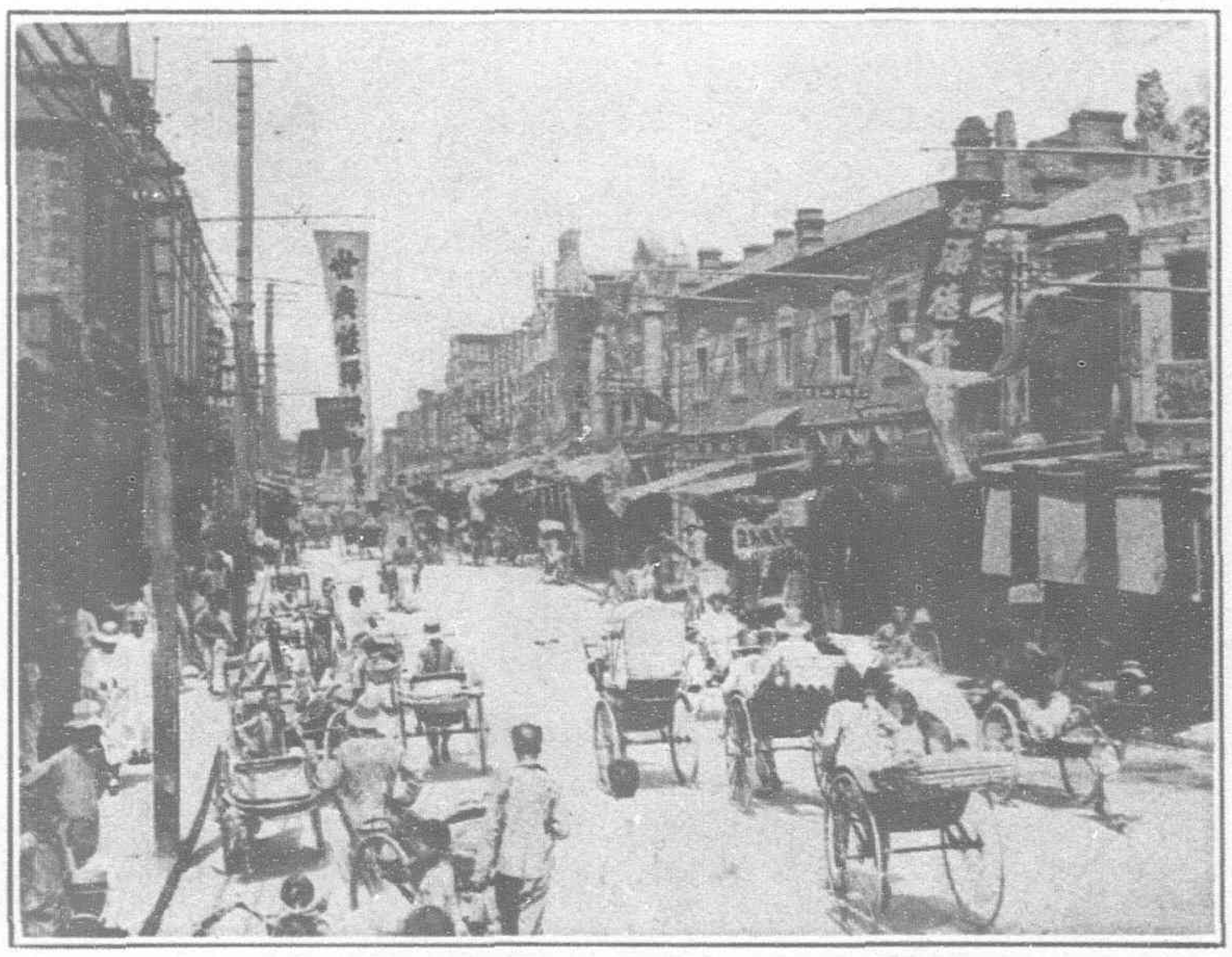
By *Hardy Jowett, F.R.G.S.*

ABOUT a century ago nothing seemed more praiseworthy to the foreign visitor than the road system in England. The means of transport from the ports to the capital by means of " magnificent and perfectly level high-ways, swiftly and without any vibration " with the sumptuous mail coaches travelling at ten miles per hour seemed to have struck strangers dumb. Even if he came from France where the art of road making was understood far better than in England, or at least was an older art, he was prepared if candid, to admire " the superior excellence of the roads, as compared with the generality of those in his own country."

When it came to the system of canals in England, even so captious a critic as the German Baron Dupin who, while not dazzled by the road system of England, was almost ecstatic in his praise of the canal system of that country. A country which " within the space of half a century had linked up opposite seas, river basins separated by numberless chains of hills and mountains, opulent ports, industrial towns, fertile plains, and inexhaustible mines, a system of more than 1,000 leagues in length, upon an area not equal to one fourth of France " he had to express himself in superlatives.

What he would have said had he visited China then or a century earlier is not possible to imagine but that he would have been lurid in his praise admits of not doubt. No country in the world is as fortunate as China in her waterways. It is possible to proceed from Shanghai to Canton *via* the upper reaches of the Yangtze River the whole length by junk, and the ramifications of waterways, rivers linked up by canals are astonishing.

Even in the matter of roads the China of several hundreds



Ricshas in the Tientsin Native City

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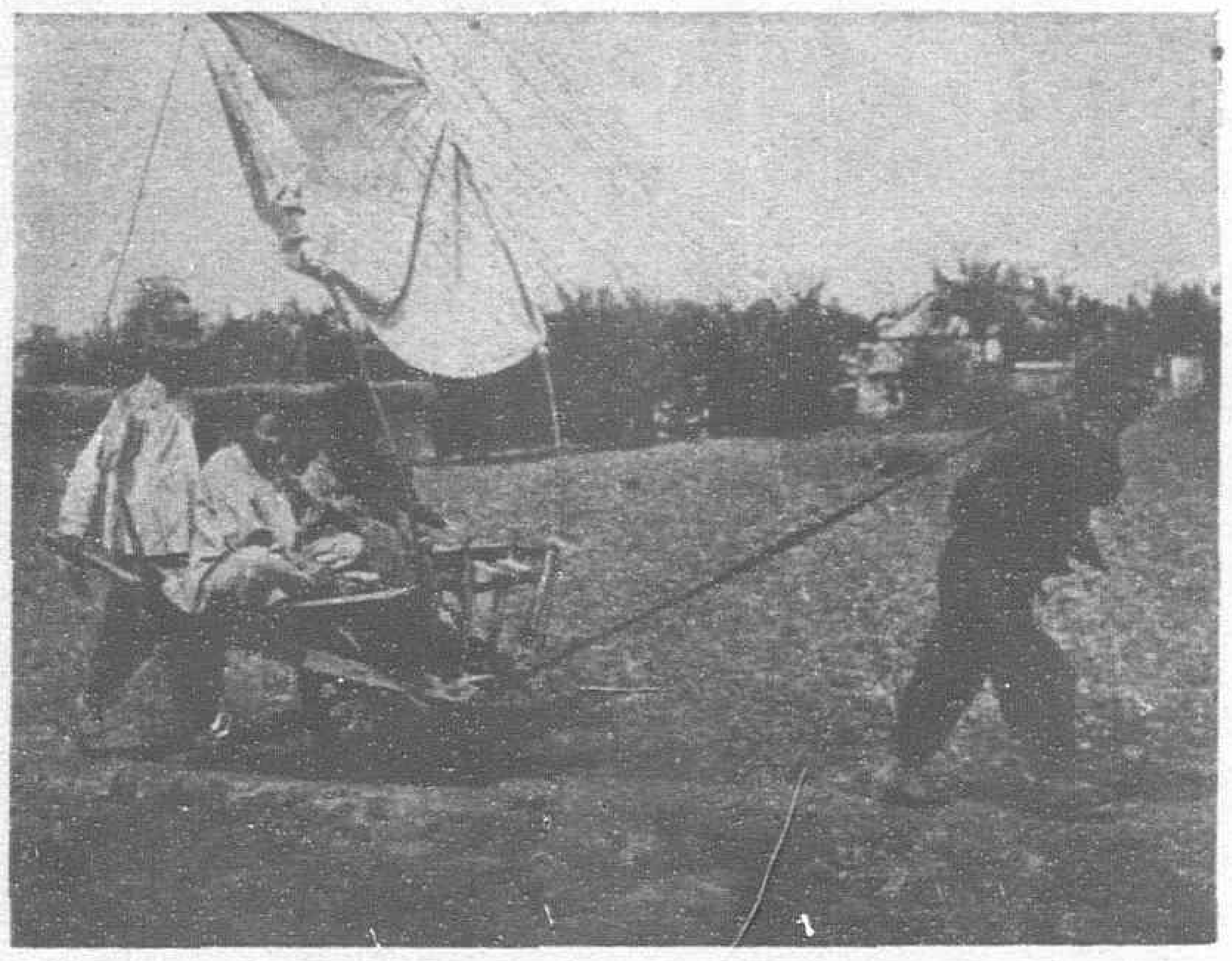
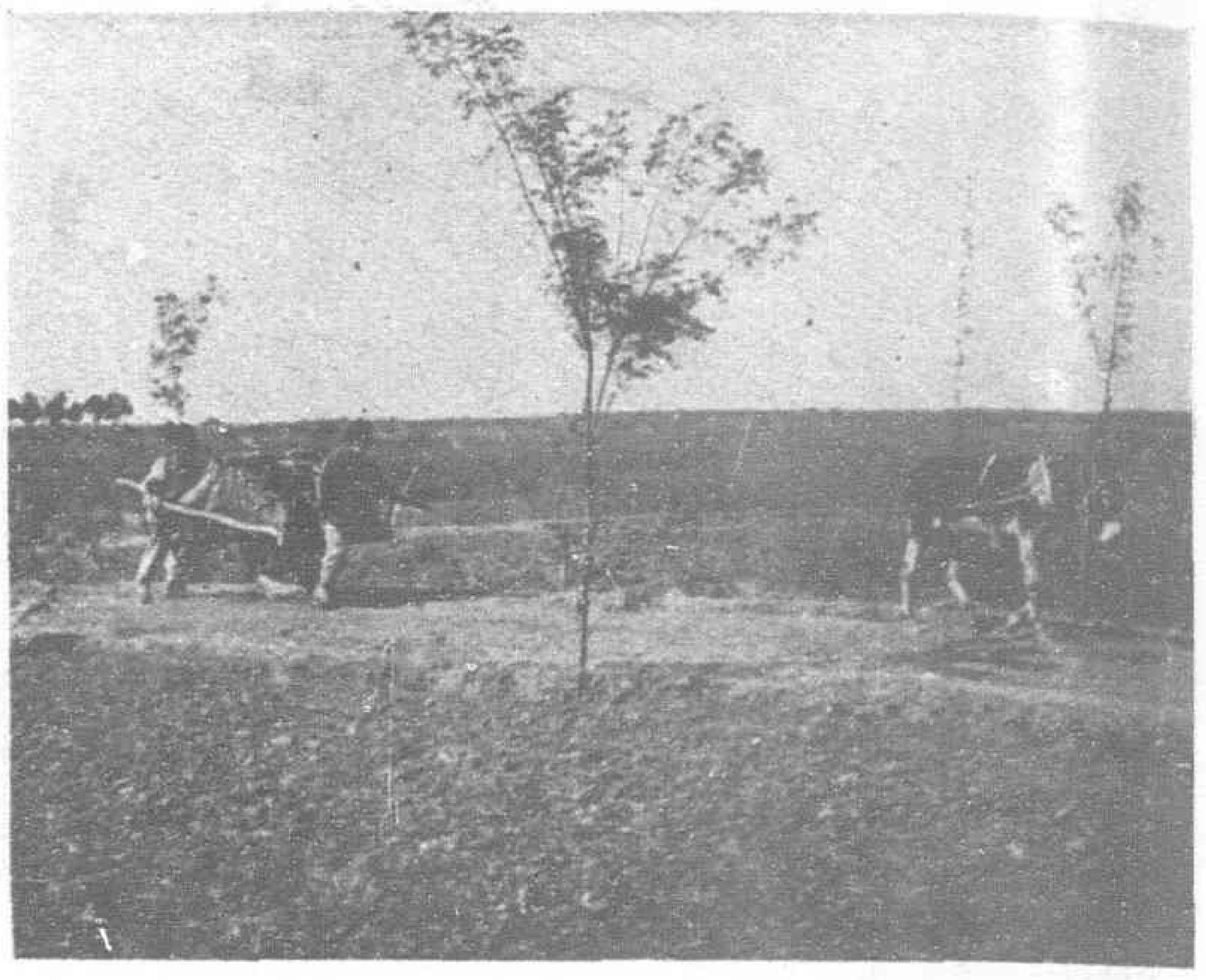
* " The Oriental Engineer," June, 1927.



A Swift Wheel-barrow in Shantung

Waiting for Passengers



Wheel-barrow Pulled by Donkey in Shantung

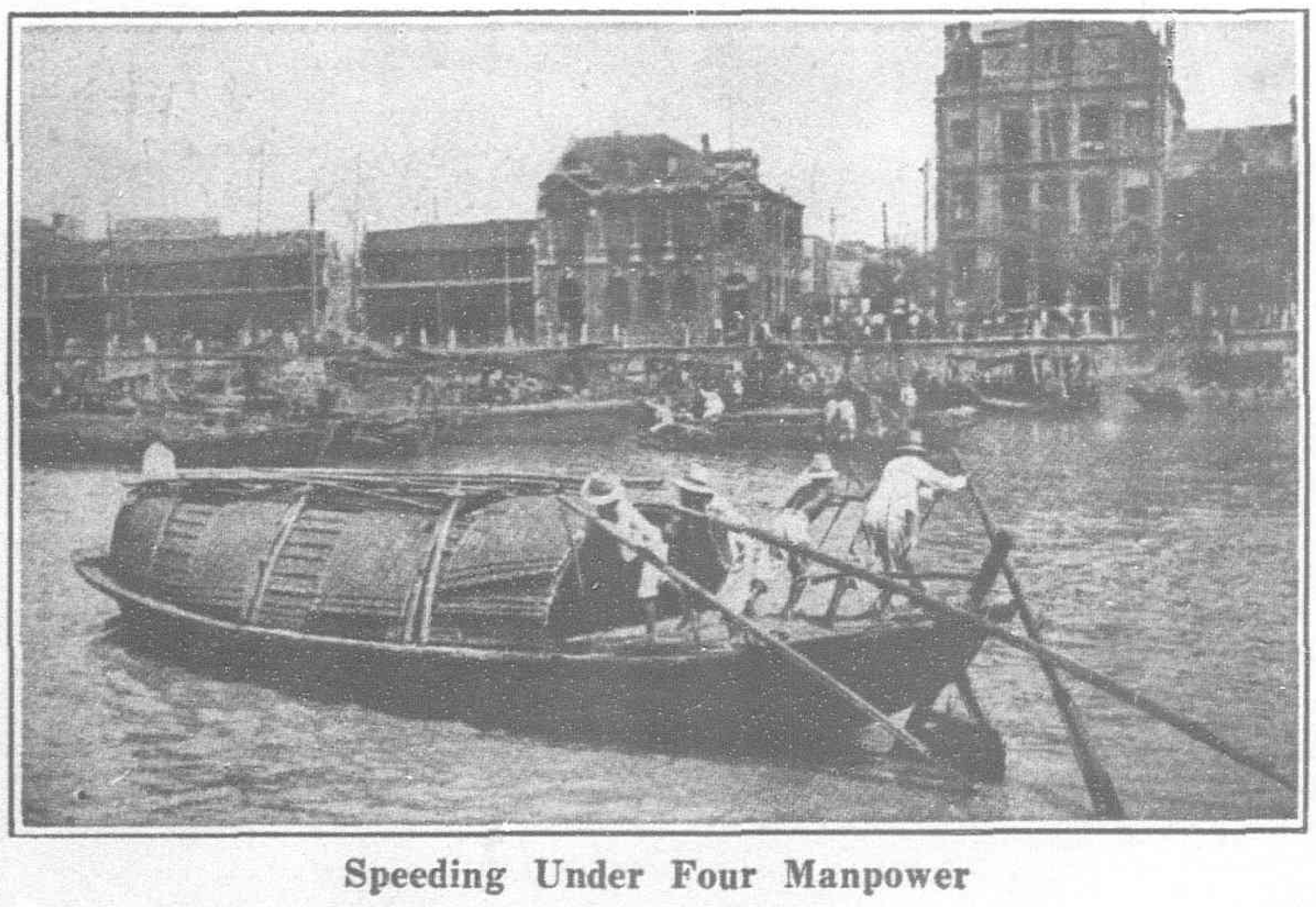
of years ago compelled the admiration of Marco Polo and other Occidental travellers. To-day after decades of neglect some of the truly continental roads suggest the adequacy of interior communications which to contemporaries were striking. That China has never developed wheeled traffic does not detract from her achievement in the matter of roads. Her Imperial highways made it possible to communicate with every part of the empire, and her couriers, by relays of 10 *li*, found it possible to convey news at the speed of 200 *li* per day. Within the last few years it has come to the writer's knowledge during times of civil war the system of courier relays, on foot, has enabled despatches to travel between two towns at the rate of 80 miles in twenty hours.

One has only to notice the great commercial routes, the tribute bearing roads, with connections all over the empire, allowed to be in serious disrepair, but yet monumental. There is no more inspiring sight, reminiscent of past greatness than the camel route down the Nankow Pass. Even the railway which runs alongside the road for some distance does not dwarf the feeling of wonder that this has been and still is a mighty highway along which millions of tons of goods borne on numberless camels has maintained an unbroken stream for centuries. To compare China's roads now with the wonderful network of roads in any western country or America is to miss the real point of comparison. Two or more hundred years ago China possibly would not have suffered by comparison with any country. A period of arrested development has however relegated the country in the matter of communications to a very inferior position, but there are signs that she will not always remain in this invidious condition.

Great Hopes

Potentially China is the most promising place in the world for communications, and, granted peace from civil strife, say for a generation, she will astonish the world. So far as powers of assimilation are concerned, she is capable of absorbing amazing amounts of material for her transport needs.

In one way she is exceedingly fortunate as compared with other countries. She is heir to all the ages in transport as well as in other directions and the costly experience which on many occasions made bankrupt more than one combination for the building of communications, is at the disposal of this fortunate country. Just as she may, if wise, skip all the intermediate inconveniences of political development and assume all the immunities of political freedom which have been won by other countries at the cost of untold suffering and persecution, she is in a position to adopt the latest and most scientific transport systems, ready made.



Speeding Under Four Manpower

Only a Step Behind

The perfected system of highways in say, England, where the machinery of great highways is administered by central boards of control, obscures the fact that less than one hundred years ago there were " thousands of odd little trusts......unconsolidated, each administrating its ten or twenty miles of road...by its miscellaneous fifty or a hundred trustees, gradually executing, it is true, the most elementary improvements, but for the most part squandering their tolls in extravagent administrative expenses, and pilling up their debts until actual insolvency beset them."

The marvellous macadamised roads which enable motor traffic to race at speeds which would have taken the breath away from De Quincey who in his " Vision of Sudden Death" describes the glory of motion at ten miles an hour as being the limit of human progress in the matter of speed, all this should not make us forget that even in those days the mails sometimes lost as much as twenty minutes in the deep loose gravel of a bad bit of road only a few score yards in length. The fight for good roads in England was long and severe and in regard to locomotion vehicles had to be suited to the nature of the roads rather than roads made to suit the traffic. In England as in and around Peking at the present day, it was attempted to make laws which limited the narrowness of the width of tires and regulate the deviation of the tread of wheels, in order to preserve the roads. After the coming into force of the work of McAdam and Telford, roads were made to suit the traffic and did not need protective legislation from the vehicles used.

We can now view with a smile the rugged lines of wooden rails later reinforced with iron made to accommodate the traffic from coal mines to distribution points, the elementary forerunners of the iron road which now covers the whole country side.

Early Railways

It will doubtless come as a surprise to many readers used as they are to the present perfected means of traction, where the only problems are bigger and faster locomotives, to be reminded that when the permanent way of the Manchester and Liverpool line was well advanced the form of traction was not determined. It was only so late as 1828 that two experts were called in to advise on the method. The problem was whether stationary engines with cable haulage should be used or locomotives. The report of the experts was very indecisive. The consultants thought that the line might be run more economically by stationary engines and cables if it was to be heavily worked at once. " But if any circumstances should induce the directors to proceed by degrees, and to proportion the power of conveyance to the demand, then we recommend locomotive engines on the line generally."

The Rainhill locomotive competition came in the following autumn and Stephenson triumphed with his locomotive. The next year appeared the standard textbook "Galloway on the Steam Engine," a gloomy outlook on locomotive prospects. "These locomotive engines have been long in use at Killingworth but notwithstanding the great exertion on the part of the inventor Mr. Stephenson.........there cannot be better proof of the doubt entertained regarding their utility than the fact that it has been determined that no locomotive engine shall be used in the projected railway between Newcastle and Carlisle." A Bill in 1829 which had received the Royal assent actually prohibited the use of locomotives.

The experiments in the matter of gradients involved enormous losses. In the early days Stephenson doubted the possibility of even the slightest gradients and many lines had to make long detours in order to ensure level roads. All these drawbacks need not worry China in the least and do not. She has been spared the expense and trouble and the latest inventions with the accumulated experience of generations of engineers are at her disposal.

The costly experiments regarding gauges, narrow or broad or standard, need not worry China. There is no need for her to make the mistake Japan made when she built her railways and now finds her traffic and speed capacity handicapped on account of having adopted a narrow gauge system. China is saved from such drawbacks and her problems of road, gradients, width, type of engine, methods of control, and the extremely complicated matter of traffic control, an exact science almost on huge lines, are all solved.

She is equally fortunate in the matter of roads in general. The evolution of road building has not been the simple problem the apparently easy perfection of modern roads in the West seems to indicate. Before the time of McAdam and Telford roads in England left much to be desired. They needed constant repair, were often built of unsuitable material and always after rains were found to be impassable in many places. Since the introduction of motor traffic it has been found that roads otherwise perfect have had to be reconstructed to allow for traffic many times faster than the quickest mail coaches. But all the adjustments rendered necessary by the introduction of a new form of locomotion have meant vast sums for experiment and the brains of engineers and even chemists have been exercised in arriving at methods of construction and the most suitable materials to be used. All this again comes as a free gift to China, who can without loss adopt the results of years of experiments and secure the best the world possesses.

Bright Future

These preliminary remarks may be extended indefinitely but their purpose is merely to show that China's condition relative to roads and transport is not hopeless. She has the nuclei of a vast system of roads, her past has shown a genius for construction, or at least a sense of the need for communications. Her having dropped behind relatively to advance in other countries is more incidental than the result of conditions which make roads impossible. Her problem is due more to sentiment and economics than to engineering or other physical difficulties. The sentiment is changing and the economic factors will yield as time goes on.

The object of this article is more economic than scientific. The technical aspects of road construction will not now be dealt with. It is hoped that a few considerations about to be exhibited will arrest the attention of publicists in this country and stimulate activity in the proper direction.

Whatever comfort may be drawn from China's achievements in the past, there is no doubt that China is now deplorably backward in the matter of transportation facilities. It is true that her waterways can even now compete between fixed points with railways. This is realised by some railways and there is, we believe, a system of railway rebates in those places which are served by water and rail. This sort of competition is necessarily limited. What is of more immediate concern are the myriads of places which for a hundred years to come cannot be served either by rail or water, and whose economic welfare is bound up with good roads.

Motor Traffic

We leave it to experts to determine the exact ratios which should exist between miles of railways to be fed by contributory roads and to professional commercial economists to determine which is more profitable, that railways to be fed should come first or feeders for the railways to have preference. Equal development considered in relation to each other strikes the layman as a reasonable principle, but so much is involved in the development and perfection of motor vehicles, running on sound roads, and the recent progress in any countries where not only passengers but goods motor carried are becoming such an acute problem that huge railway corporations are seeking to apply their monopolistic privileges to curtail motor borne traffic, that it is probable that motor traffic can be considered apart from railroad activity.

Instances of this kind are seen around Peking. In spite of the excellent 80 miles of rail between the capital and Tientsin, there are flourishing motor bus companies running along the road which for the most part is parallel with the railway and it only needs absence of interference from the military now infesting this part of the country with commandeering of motor vehicles and forced free rides for soldiers, with more attention to upkeep of the road to make this traffic a sound paying proposition. Even now money is being made, but with favorable conditions the business will expand enormously and need not seriously interfere with railway traffic.

These ventures like railways create demands. The mass of population is so dense that not a single railway in China has yet been able to provide for the actual travel needs of the district through which it runs and the thousands of camels and other burden bearing animals one sees daily dragging side by side with the railway from Kalgan and parallel with the line from Mentoukow would seem to indicate that these two lines are not equal to the traffic in the two districts. The potential travel needs of the Chinese have not yet been tapped and given facilities it is amazing how people respond. The possibilities are unlimited.

Even tramways in Shanghai and Peking, which it was feared might destroy rickshaw traffic, have done no such thing. The tramways have actually created a travelling public and rickshaws are more numerous in both places since the newer methods of travel were introduced.

Traffic Feeders

The agitation a year or so ago in Peking when it was seriously intended to compel the tramway company to set aside a certain proportion of its earnings to provide training and occupation for the rickshaw coolies who were to be rendered unemployed is now seen to be ridiculous. The same thing will be seen in any part of China where motor traffic is introduced. The response will be immediate and certain and such will be the calling into existence of a new travelling public, and also a carrrying trade that generations of expansion on a liberal scale will be required to meet the needs.

This is one economic aspect of motor traffic immense, unthinkable almost, but sure and certain as experiments have shown already. There is money in abundance to be made. There is, however, another economic aspect of even greater importance and this is the relation of motor traffic not only to the convenience of a waiting travel public but to its general economic life.

China is supposed to be, and probably is, the richest country in the world in regard to coal deposits. Not only is this so relative to the mass of coal waiting to be mined, but in its proportion to the number of inhabitants, and yet, the fuel famine in the country is even now not only interfering with the growth of industry but of population and if means are not devised to overcome it, general industrial development will be impossible and population will be increasingly affected.

The Duke of Bridgewater's canals immediately halved the cost of coal in Manchester and eight years later the Birmingham canal did the same for Birmingham. The monotonous bread and cheese dietary in the south of England, with its ill effects on health and infant mortality, was due in part to the lack of firing and it is no surprise that the social benefits of cheap fuel are so much heard of in connection with cheap transport.

The dietary of the Chinese is amazing in its simplicity and yet the almost infinite variety of foodstuffs over large areas is great. Food is the question among the Chinese, but so intense is the struggle for existence that quantity is the main consideration among them. How many sections can exist on the monotonous diet they are compelled by local conditions to accept is a problem. The effect of food on character has been cleverly worked out by Buckle in his History of Civilization. The relation of the two is shown to be definite. Apart, however, from this aspect of the question, there is the physical well being which the modern science of dietetics has recently brought into prominence.

It has been shown that a variety of foodstuffs each containing elements not only essential to life but to life in its highest and most effective form is more important than generally recognised. Whether the limitation to one or two staple articles as is necessitated among Chinese communities is best calculated to maintain bodily and mental fitness at its best may be a debatable question, but that the necessary production of certain foodstuffs in localities where it would be more economical to grow other things is conductive to the best economic interests of the community, is not open to doubt.

The cultivation of peanuts in certain districts in Shantung is far more profitable than growing wheat, just as wheat culture in other regions on account of soil qualities, is more profitable than that of others. But so long as on account of traffic limitations each local community must be self sufficient and grow all that it needs for its subsistence, so long will they be compelled to curtail their production of crops which yield a larger money return. The essence of profitable production is that regions should produce that commodity which they are fitted by natural conditions to produce.

Lancashire by having a humid climate suitable for the spinning of cotton yarns has by taking advantage of this natural endowment made for herself the premier position in the world in this relation. If however she were compelled to devote a large section of her industrial works to the cultivation of cotton, assuming that the climate were favorable, she would proportionately decrease her output of cotton yarns, or if she were not able to import cheap wheat but compelled to grow it within her own borders she would suffer in the same way. It is because cheap transport enables her to secure raw materials for manufacture and food that she is able to take full advantage of other countries' abilities to produce the staples on which her prosperity depends.

Cheap Transport

Guarantee food as cheap or cheaper to the Shantung farmer and he would at once concentrate on his ground nuts and secure a money return far higher than his mixed crops now assure. He would have a surplus which would not only assure his ability to purchase imported food but to buy other goods as well. As it is, there are official regulations determining the proportion of land to be devoted to various products, on the principle that if say groundnuts are cultivated to the curtailment of other foodstuffs, there will be a shortage of the latter and consequent rise in price, so that the money advantage secured by the better priced crop would be cancelled by the dearness of the other supplanted crop. Cheap transport would remedy this and full advantage could be taken of natural conditions favorable to the crop best suited to the soil.

If the extensive rice fields in Chekiang could be used for the more paying mulberry shrub, and rice as cheap or cheaper be imported by means of cheaper transport than now available, the total money return for the province would grow exceedingly and not only would she herself benefit but other rice producing provinces would. Each would buy the exchange of commodities they are best fitted to produce enjoy the profits resulting from the other. Present conditions due to lack of facilities for the exchange of commodities tend to stagnation and not to progress.

Fuel Transport

To return to fuel famine in many parts of China,. There are vast tracks of unenclosed common land which while capable of being brought under cultivation must of necessity be reserved for fuel in the shape of scrub and grass roots. Armies of children who would be of more economic value to the community if they could attend school or learn a trade, are compelled to spend their time in raking and cutting. The ill effects of this system are felt in many ways. The labor expended in raking and cutting if put into cultivating the land gone over would materially increase foodstuffs. One reason why such land is barren is due to excessive erosion under heavy rains which is made possible by the removal of the binder grass roots due to raking for fuel, and yet the yield is so small that proper cooking of food is not always possible. Adequate communications would remedy all this and land and labor supply would profit.

China Must Trade

In countries like China where famine is so common, the immense benefits from quick and cheap transport of foodstuffs from places which concurrently with such famines have a surplus only needs to be mentioned.

Industrial expansion in China has not yet really begun, nor can it possibly take place under the present conditions of absence of transport facilities. It may be said that China has jogged along for millennia under present conditions, and why change. The time for this sort of talk has passed already. China is changing and will continue to change. It is only a question as to how rapid the change will be allowed to take place. Could she become a hermit kingdom and continue to exist independently of other countries there might be no problem. But having entered the comity of nations she cannot now remain static and moreover it is essential for the well being of industrial countries like England and America that markets be found for their productions, just as now it is becoming necessary that other countries take commodities that China can best produce. Only the lack of internal communications inhibit the immense expansion of mutual trade.

Internal communication facilities are not to be considered as limited to the transfer of imported and exported commodities from the interior to the coast, but extend to inter provincial and local communications which will make possible a quick change of commodities between places best suited for their production, with the result that the maximum return may be secured by each and the further result of a surplus which will enable purchase of other commodities best produced in countries other than China. The whole problem is one of circulation of movement and transport solves the problem.

In a further article the actual condition of roads in China will be considered with special reference to motor transports, and future possibilities.

China's Minerals

(Continued from page 370.)

producer of tungsten. Whereas in 1915 her output was insignificant, by 1918 she contributed 10,500 tons of the 35,800 produced, and in 1922 her share. was 70 per cent. of the total. The metal exists in at least four of the southern provinces. And in essentially those same regions is to be found manganese. The Chinese made their first experiments with this metal in the Hanyang steel mills about twenty years ago. Since then various manganese deposits have been discovered. The ore is of an exceptionally rich content, averaging from 40 to 45 per cent. At present China's production amounts yearly to some fifty thousand tons.

I might mention yet such metals as mercury and bismuth, but their meager importance would not justify the space. Of one mineral, however, I must speak. It is petroleum, the product which has latterly attracted foreign powers. While it is reasonable to expect the discovery of vast petroleum deposits in China, thus far prospectings have proved disappointing. Those made in 1914 by our Standard Oil Company in the province of Shansi led to nothing. True the Chinese government works a few wells, though their yield is mediocre. More promising are some deposits discovered recently by the Japanese in southern Manchuria. Notwithstanding past disappointments in this regard, experts have not abandoned their dreams of making rich petroleum finds in the celestial empire.

For the present, however, China's complicated mining laws discourage foreign syndicates. For her distrust of foreign capitalists the Western powers should blame chiefly themselves, since, aside from the United States, they have always sought to encroach. Nor is it logical to expect in the near future much change in China's attitude. But when the political factions conclude peace, the Chinese government will probably realize the wisdom of granting more reasonable concessions. Such a change could not fail to stimulate the development of China's mineral resources.

Gold Mining in Heilungkiang Province[*]

By V. A. Kormazoff

Gold mining is regularly developed in three localities of the province of Heilungkiang:

the district of Hei-ho
,, ,, ,, Mergen and
the northern part of Barga.

Gold mining flourished in these places in 1923 and 1924.

Since 1925, when the better gold yielding areas were exhausted, work at the mines has begun to decline.

At the present time the aggregate number of workmen engaged is not over 3,000.

Besides Chinese gold mining enterprises, a British concern, represented by Mr. Pilcher, also began prospecting work in the Aigun district, and entered into an agreement with Chinese companies for the working of certain deposits in the valley of the Faber river, *viz.* the Fung Wan-kungssu and the Tai Pin-kungssu.

An American—Fowler,—with a group of American engineers, is prospecting in an area some 30 or 40 kilometres from Sahalian (Taheho). They are working with hand and horse driven borers.

Total production of gold for the past two years is not in excess of 100 to 120 poods (in 1923 and 1924 the output of gold was four times larger, equalling about 500 poods).

During the past two years the mining offices considered the work worth while whenever a workman delivered per day not less than 0.50 zolotniks of gold, that they did not suffer any loss if he delivered 0.33 zolotniks and as a loss when he delivered less than 0.33 zolotniks.

The work at the mines is being carried on in a primitive manner with trays and American pans; dredges are not used. The gold is found in pretty large size nuggets. From time to time nuggets are found weighing several pounds each. Nuggets weighing several zolotniks are very common in these places. The average yield of gold from 100 poods of ore is 1.5 zolotniks. However, deviations from this average figure are quite frequent. Thus, two years ago certain lots in the mines of Fung Wan-kungssu yielded as much as 48 zolotniks of gold per 100 poods of ore.

Gold is delivered to the mining offices at a valuation which is fixed in advance and usually does not exceed three Chinese dollars for 1 zolotnik, without assaying.

The mining offices are always protected by a military guard, and an official is living there whose duty it is to collect a royalty in favor of the government amounting to 50 cents on each zolotnik of gold washed. The military not only protect the mining district from outlaws and brigands, but also daily assist at the final washing of gold and the removal of slick.

Besides, at each mine there is a shop for the workmen, where they are obliged to buy all their necessaries.

The *Mergen mines* are located 70 kilometres to the west of the city bearing the same name. They are owned by a Chinese company and managed by a Russian mining engineer, Evdokimoff. The average yearly output of gold does not exceed 5 to 6 poods. The working of placer deposits is very primitive—the same as all over Heilungkiang province, being effected with American pans.

The *Kellari mines.* The beginning of gold mining operations in the Kellari district dates back to 1901, when the Russian government entered into an agreement with China, under which it obtained five concessions in the district of Barga. Among these concessionaires was the Upper Amur Gold Mining Company, which obtained concessions of an area of 70 to 80,000 square versts between the Great Hingan range, the Bystraia and Argun rivers to Lake Dalai and the watershed of the tributaries of the Halha and Hailar rivers.

Upon obtaining this concession the Upper Amur Company spent a considerable amount of money for prospecting, and discovered gold bearing sand of the Kellari river. The working of these deposits was begun by the Upper Amur Company in 1916. At the end of 1920 the Company was forced to cease its operations at the request of the District Chief, and from then on the work on the Kellari mines is carried on by the Kuan Hsin-kunhssu, a Chinese company.

The mines are located at a distance of 20 kilometres from the city of Shi-wei. The mining office is 15 kilometres from the city. It is the residence of the management of the mines, the military guard and the official for the collection of government royalties on each zolotnik of gold delivered to the office. The deposits proper are at a distance from 6 to 7 kilometres from the office.

The working process is the same as in the mines of the Hei-ho district, with the difference that in the Kellari depoists the gold bearing sand is obtained from old placers. New pits, such as are to be found on the Chinese side of the Amur river, are not made. The working proceedings are most crude.

At the present time the gold bearing sand is obtained from the "pockets" of the Kellari valley at Orehovo and Yaroshiha. The gold is in small lumps and of low fineness (350). The largest pieces obtained weighed 1.5 zolotniks.

The total quantity of gold obtained from these mines cannot be exactly established, because a certain proportion of it passes through the hands of illicit prospectors; it is also unknown how much gold was washed (before 1913) by the Chinese government, but judging by the average output in the period from 1913 to 1916 it cannot have exceeded 5.5 poods. In 1926 with 150 workmen the output, according to approximate calculations, amounted to about 8 poods. On the Kuanshi mines it was 5 poods.

The Upper Amur Gold Mining Company estimates the total output of gold during the whole period of the existence of these mines at not less than 100 poods.

Accordingly, the total annual output of gold recorded by the mining offices of the province of Heilungkiang in the past two years amounted to 120 to 128 poods, approximately distributed as follows:

Hei-ho district	110 to 115 poods
Mergen district	3 ,, 5 ,,
Barga	10 ,, 13 ,,

However, this represents only gold which the workmen deliver to the offices, whereas gold undelivered amounts to not less than 30 per cent. of the annual production judging by the Kellari mines; consequently, these undelivered quantities would amount to:

about 35 poods in the Hei-ho district
,, 1.5 ,, ,, ,, Mergen ,,
,, 5 ,, ,, ,, Barga ,,

Besides this regular mining of gold, bands of illicit prospectors are roaming in the wilderness of the forest country many hundreds of versts from any habitations, where roads are replaced by footpaths trodden by wild beasts. During the past few years, when work at the mines was greatly reduced, the whole country has been full of them.

Illicit prospecting has existed in Heilungkiang province for many scores of years.

The scope of work of these lawless prospectors can be judged in part by the activity of numerous gold buying offices and shops in the city of Sahalian (Ta Hei ho). According to statements made by certain gold mining firms, these offices and shops handle not less gold than the regular mining offices. It is true that a certain amount of contraband gold, brought from the Soviet side of the Amur, also passes through their hands.

In the pre-war years as well as during the Great War the contraband traffic of Russian gold sometimes amounted to as much as 150 poods; now it has dropped to 80 poods.

A rather considerable quantity of Soviet gold also passes through the numerous Chinese grocery shops which are scattered here and there along the banks of the Amur and the Argun rivers.

Accordingly, Heilungkiang province is rich in gold deposits. They are being worked for considerable length of time already; however, in spite of this, the industry is not progressing, but declines from year to year. Apparently, private persons are not in a position to place this industry upon the necessary level of efficiency; they lack capital for rational and expensive prospecting, the purchase of foreign improved machinery, dredges and so forth. The working of the placer deposits with American pans, involving an expenditure of hundreds of thousands of roubles, scarcely enables them to make both ends meet.

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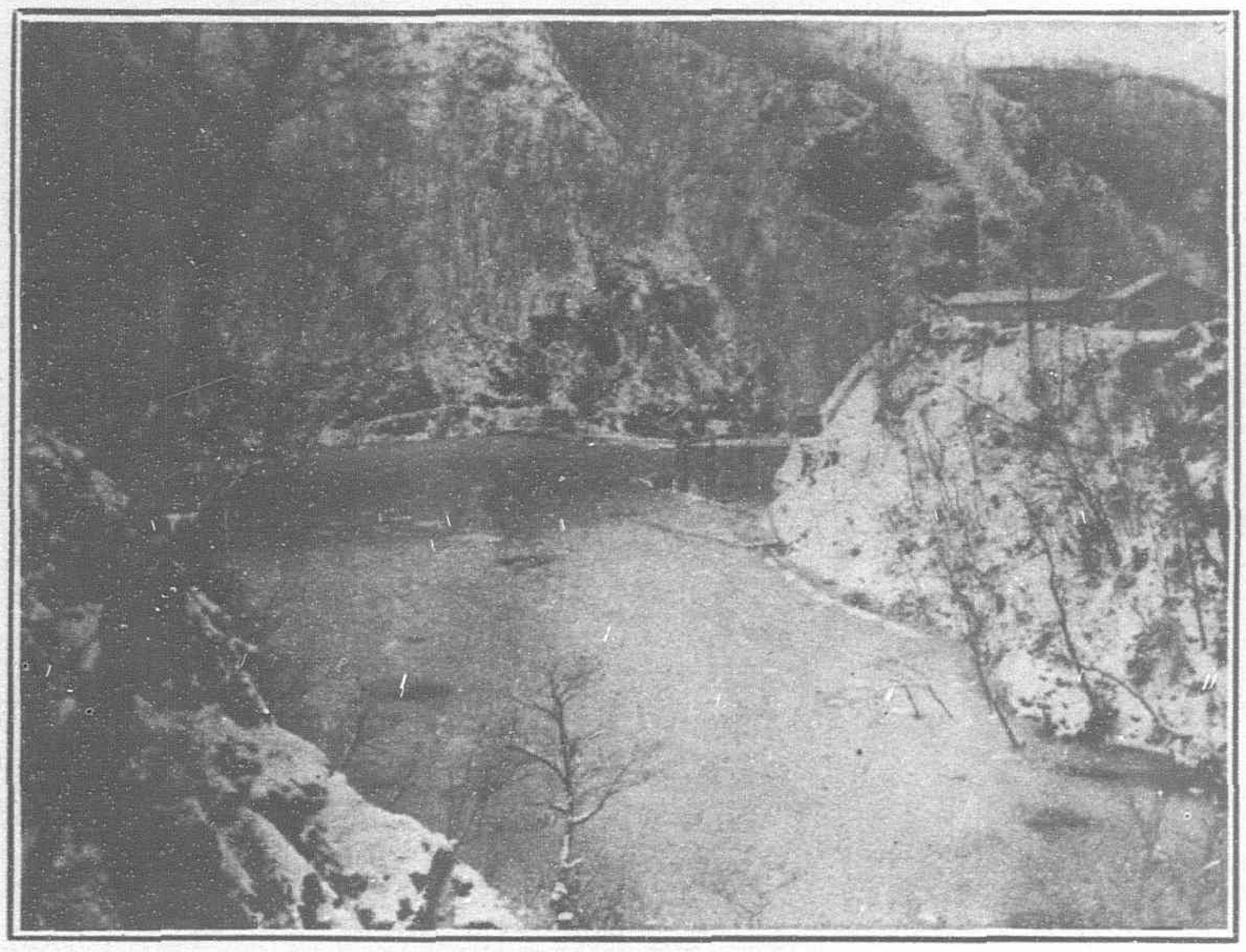
[*] "Manchuria Monitor"



Intake at Tenzankei

General View of Tenzankei Hot-spring Resort

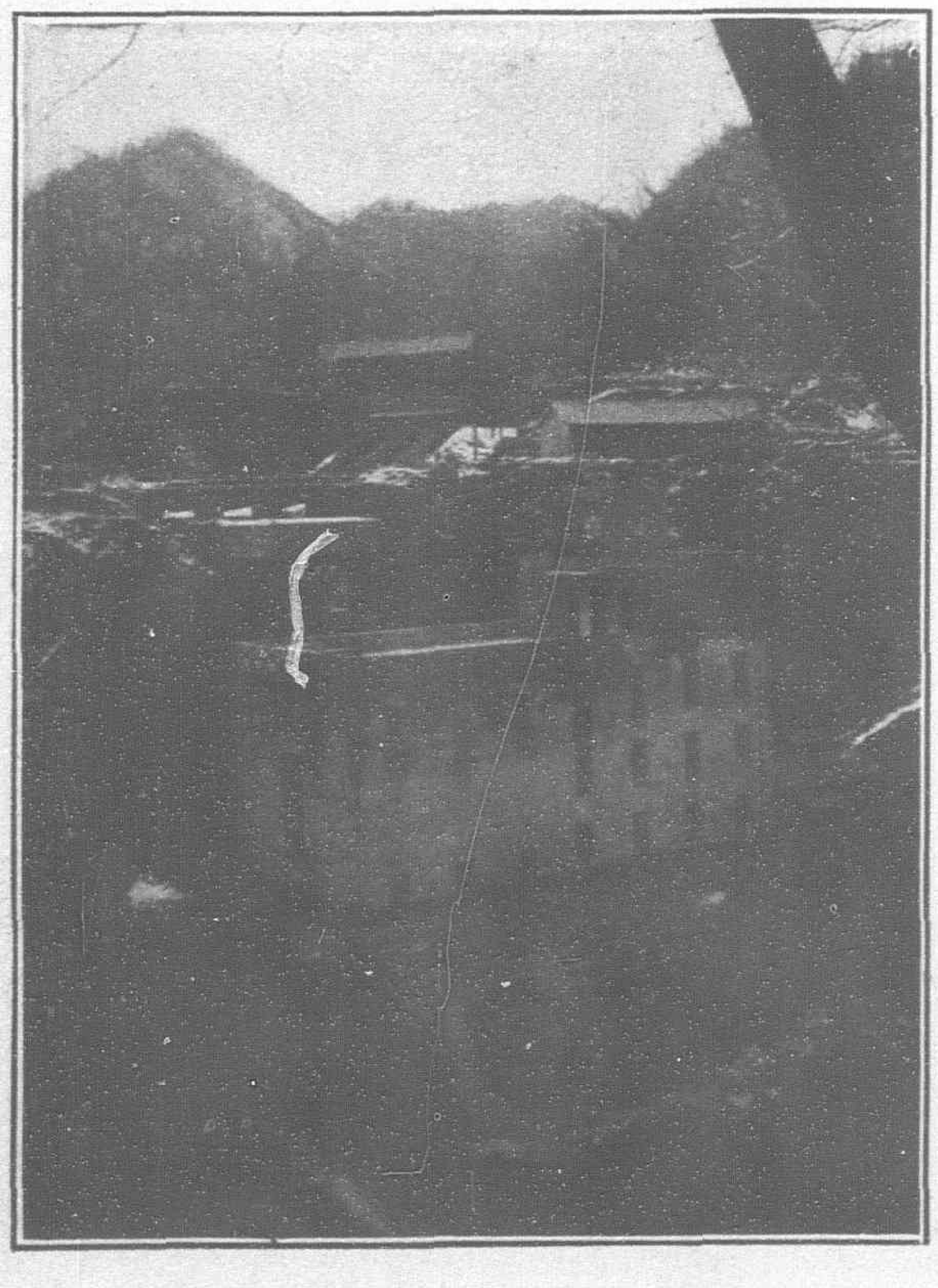
Ichinosawa Power House

THE Ichinosawa Power House of the Hokkai Hydro-Electric Power Company, Ltd., is located on the right bank of the Toyohira river, a spot about 24 kilometres south-west of Sapporo, Hokkaido. The capacity of the plant is 3,600 k.w. with a power factor of 80 per cent. The Hokkai Hydro-Electric Power Company supplies the city of Sapporo and its surroundings with light and power.

The source of water supply is Tenzankei Gorge, the intake being placed at Kiriwari, about 500 metres downstream from Tenzankei hot-spring resort. The length of the dam is 86 metres. The width of top of dam is 4 metres, while the width of its base is 19.1 metres. Seven gates are equipped with the intake, and these operate according to the volume of water available.

The power canal consists of a tunnel with a total length of 2,054 metres and a conduit with a total length of 617 metres. The cross section of the tunnel and conduit is of a horse shoe shape with a height of 2.97 metres and with a gradient of 1-1,200. The water flows at the rate of 12.81 cubic metres per second. The tunnel and conduit are mortar lined and concrete protected. There is a pier with a regulating gate. The overflow flows through a spillway canal with a gradient of 1-1,524, with a width of 2.7 metres and a depth of 1.8 metres into the Toyohira river.

The waste weir has a gradient of 1-800, with a length of 55.2 metres. It consists of a tunnel, 14.85 metres in length, a conduit, 31.5 metres in length and an open canal, 10 metres in length. The tunnel as well as the conduit have a width of 3.64 metres and a height of 1.82 metres respectively.

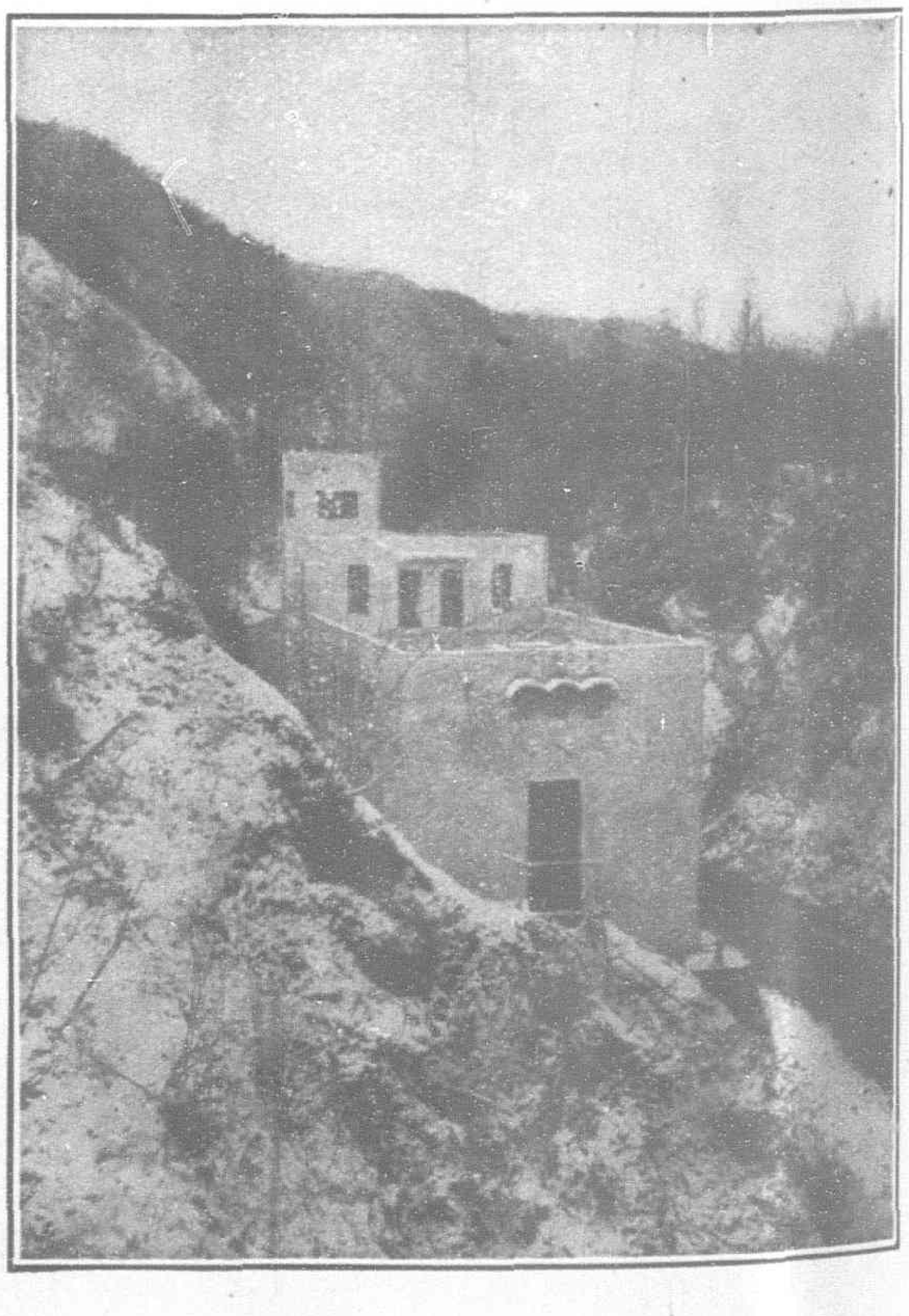


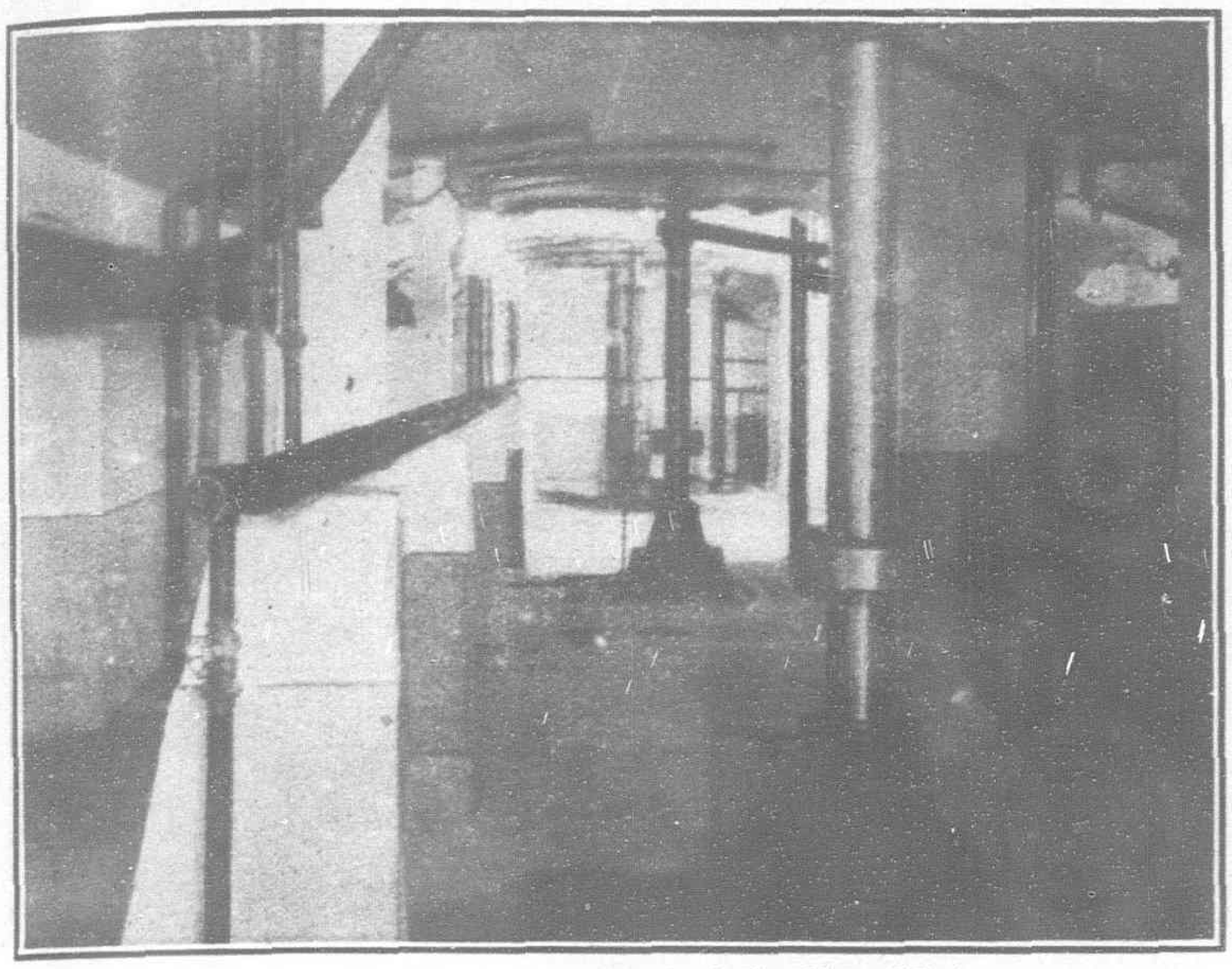
Right:

A Rear View of Ichinosawa Power House Building.

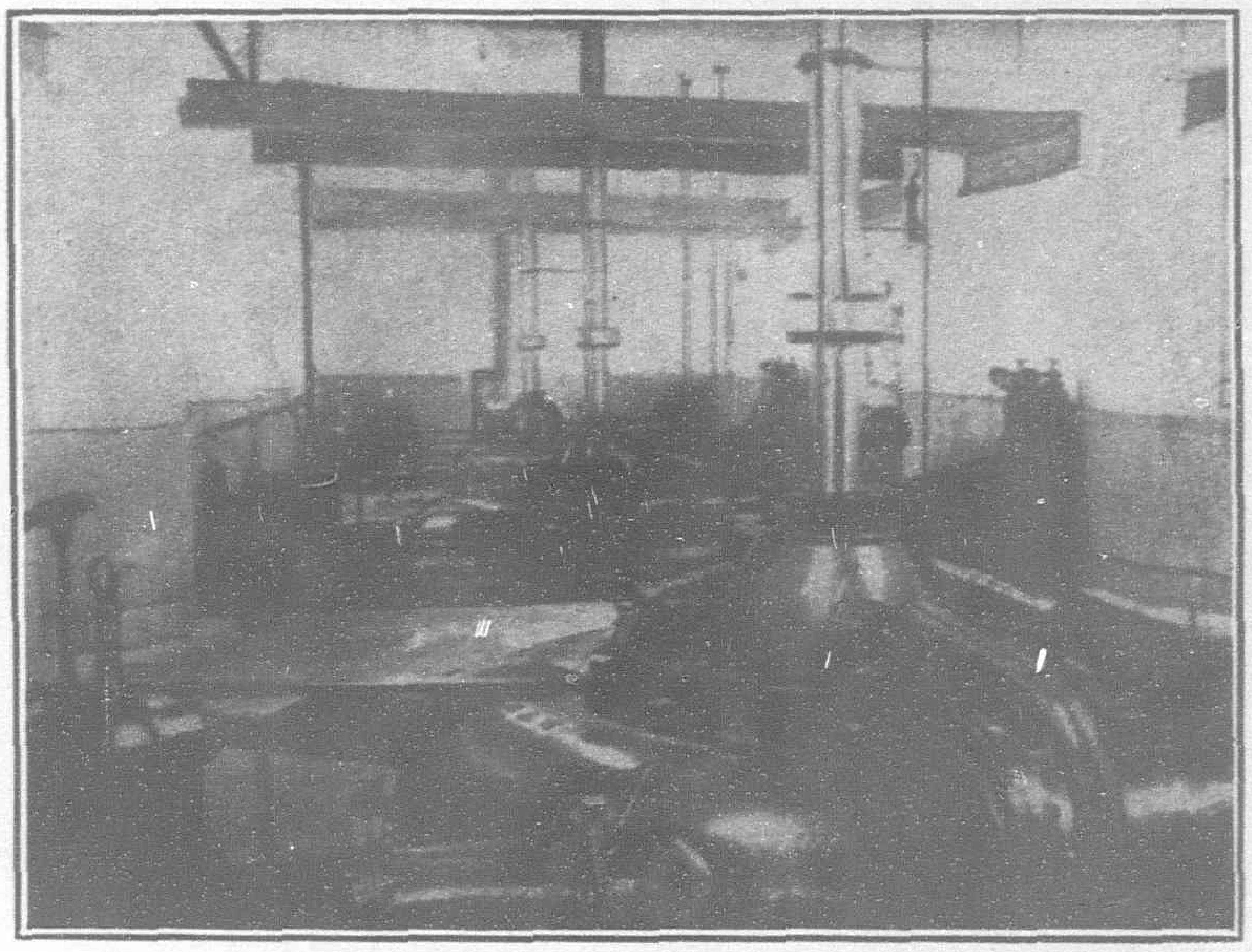
Left:

A General View of Ichinosawa Power House Building.





Room with Pipes for Oil and Cooling Water



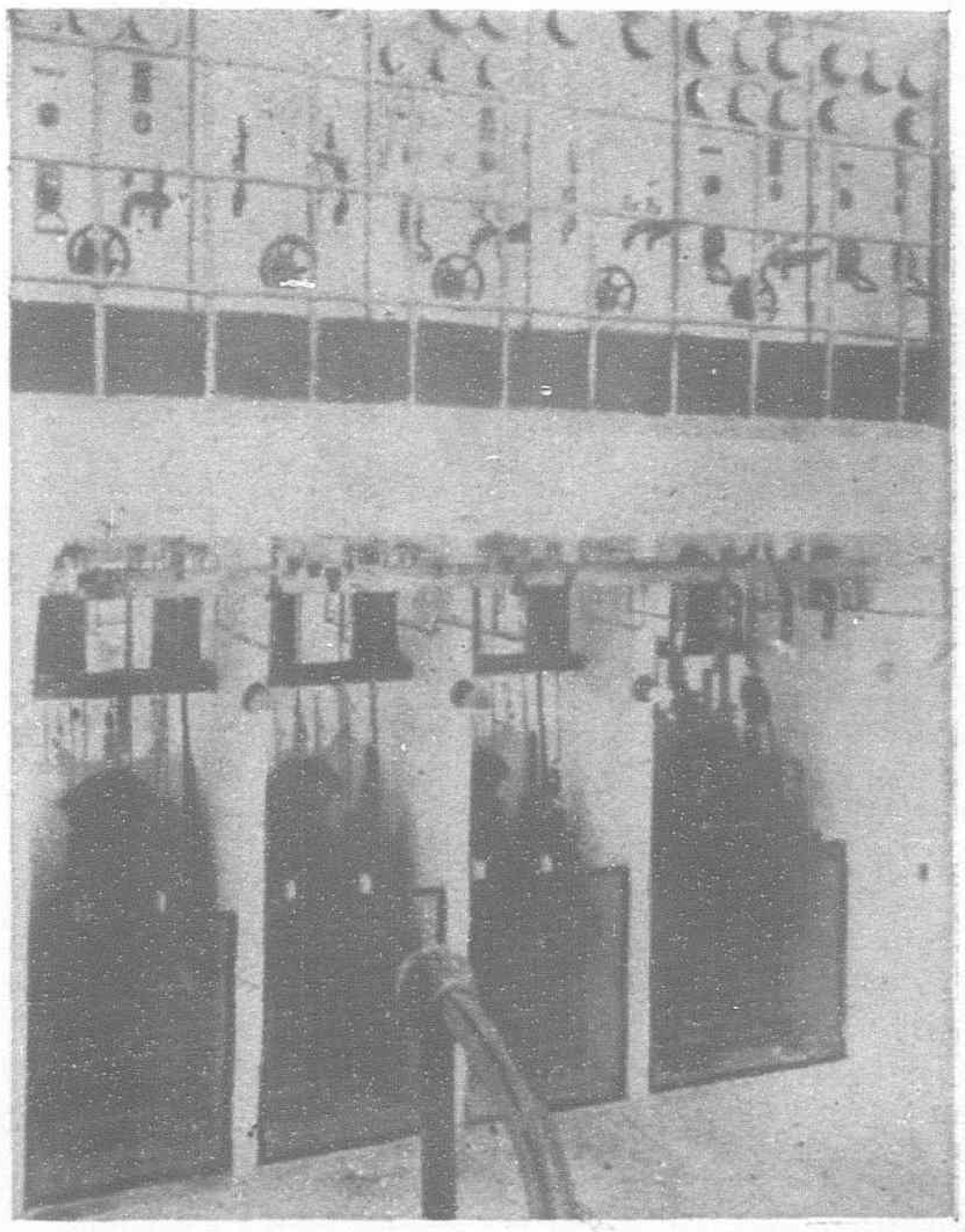
Turbine Room, Equipped with Three 1,800 H.P. Spiral Water Turbines Manufactured by the Denyosha Company

The main pressure pipes, three in number, have been supplied by Fujita Steel Works, Ltd. The pipes are of mild steel rivetted ones with the three different lengths of 110, 113 and 157 metres, the inside diametre of each pipe being 1.47 metre.

The Power House is erected on the rock on the right bank of the Toyohira river. It is a six-storied reinforced concrete building with two basements, one of which is turbine room. Generating room, transformer room and oil switch room are on the ground floor with a total acreage of 221.5 square metres with a height of 9.1 metres. A 15 ton crane is installed in the ground floor.

The Transformer room and oil switch room are respectively divided into two. The upper part of the former is used as extra high tension room, while that of the latter is switchboard room. Adjoining to the switchboard room is telephone room.

In the basement which covers 141.2 square metres in area with a height of 5.46 metres, there is turbine room. Oil pressure pump room is also in the basement.



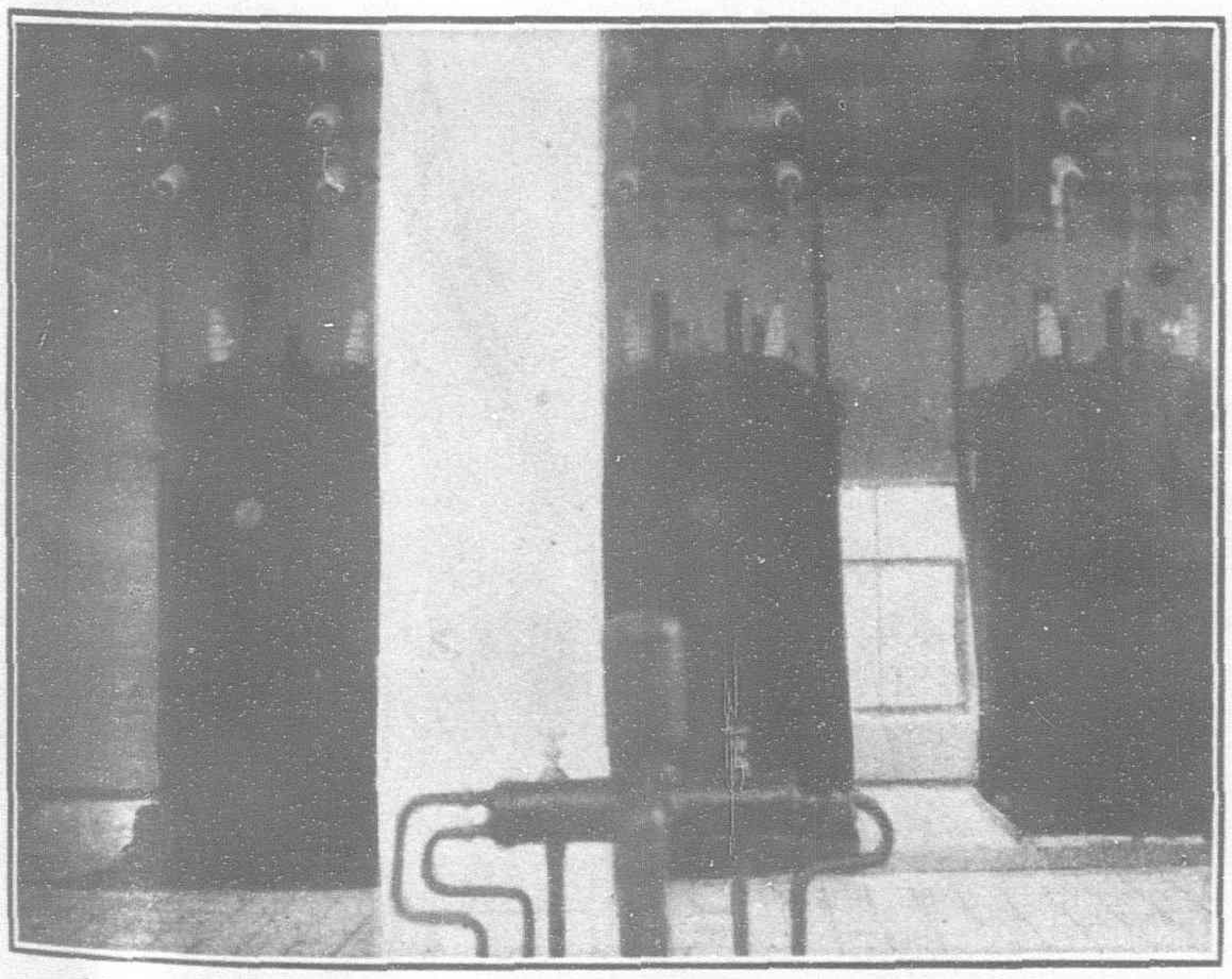
Switchboard of Ichinosawa Power House, Made by the Fusi Electric Manufacturing Co.

In turbine room are three Dengyosha vertical type Francis spiral water turbines and two Pelton wheels for oil pressure pump. The main turbine has a generating capacity of 1,800 h.p., and 40 meters of effective head and utilizes 4.2 cubic metres of water per second. The speed is regulated by an oil pressure system automatic speed governor manufactured by the Dengyosha Company.

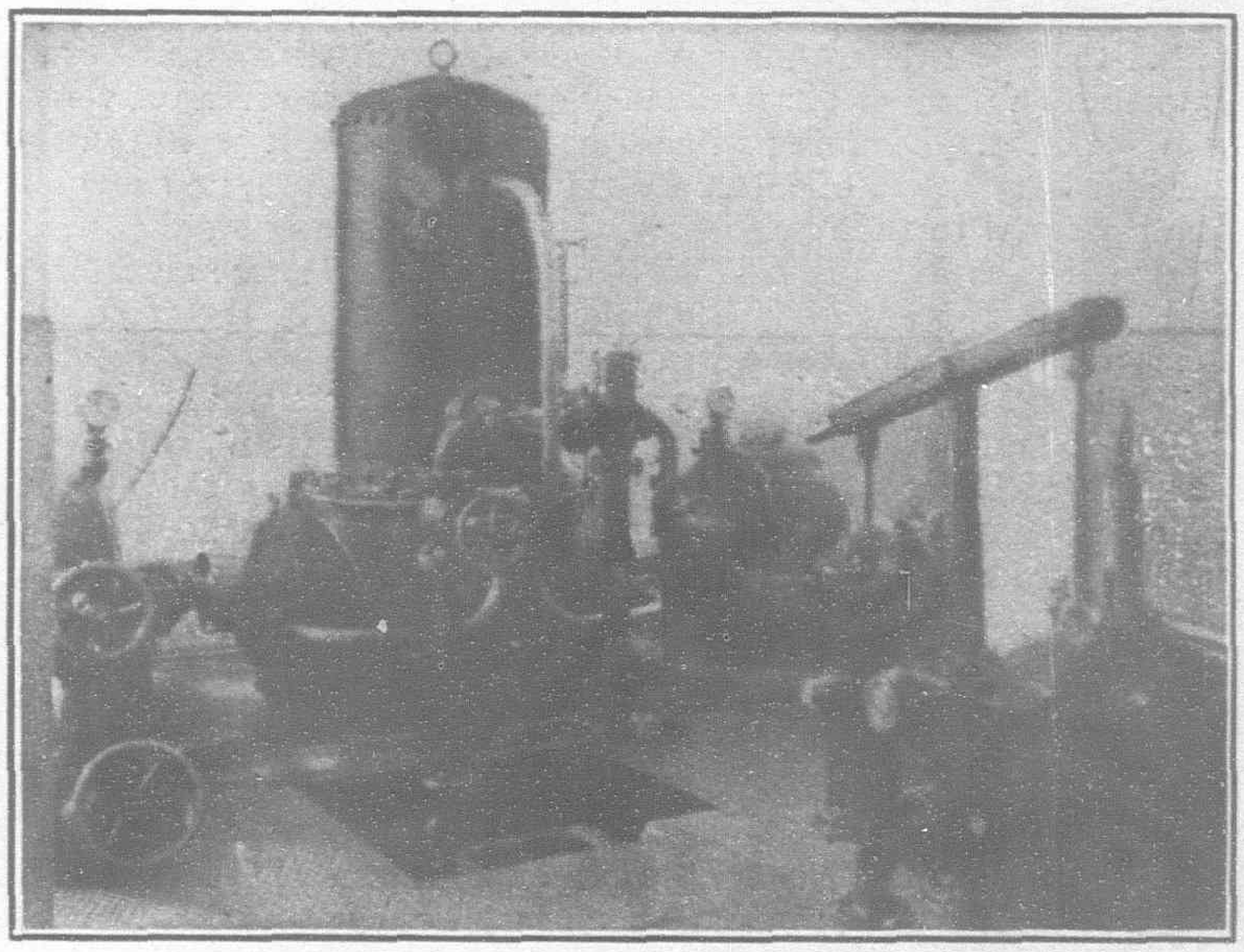
The generating equipment consists of three Shibaura revolving field type alternating current generators, rated at 1,500 k.v.a. three phase, 60 3,500 volts. In addition, there are three 30 k.w. 100 volt direct current compound dynamos.

Four 1,500 k.v.a. oil and water cooling system transformers made at the Hitachi Iron Works are provided in the transformer room. The primary voltage is 3,500, 3,250 and 3,000 volts, while its secondary voltage is 22,000 volts.

The Main switchboard has been supplied by the Fusi Electric Manufacturing Company, Ltd.



1,500 KVA Transformers made at the Hitachi Iron Works



Oil Pressure Pump installed in Turbine Room

Engineering Notes

Kalgan-Tolunnoerh Light Railway.—The application for permission to build a light railway from Kalgan to Tolunnoerh (Dolonor) by a merchant named Hwang Yu has been provisionally sanctioned by the Ministry of Communications. The applicant is required to apply for formal registration within one year and submit a detailed report of the project.

Nanyang Brothers Tobacco Co., Ltd.—A total net profit of $2,300,894.40 was realized for the financial year ended October 31, 1926, by the Nanyang Brothers Tobacco Co., Ltd., cigarette manufacturers and leaf tobacco importers and exporters as against $1,220,077.06 for the previous year, according to their seventh annual report. The following appropriation was authorized : $115,044.72 as ordinary reserve, $295,754.91 as special reserve, $1,200,000.00 as interest on shares, $73,938.72 as rewards for services, and $123,231.21 as encouragement fund to staff, leaving a balance of $492,924.84 to be carried forward to the next account together with the balance of $638,314.18 brought forward from the last account, making a total of $1,131,239.02. The company is capitalized at $15,000,000.00 at $20 per share. It has at present an ordinary fund of $1,004,027.19 and a special reserve of $3,451,854.53. The president of the company is Kan Yok-kai and the vice-president Kan Hung-chiu. The auditors are Jackson Lau and Chou Ching-chuen. The head office is located in Shanghai with branches in Tientsin, Hankow, Hongkong, and other places. In Shanghai the company has a main office at 144 East Seward Road, a factory at 1-2 Dent Road and another in Pootung, and a sales building at 390 Nanking Road and another on North Szechuen Road.

Shale Oil in China.—A long-awaited event of considerable importance took place recently at the Fushun Collieries in Fushun Fengtien Province, China, when the first fire was built under the recently constructed experimental shale oil distillation furnace says Vice-Consul A. I. Ward, Mukden, China, in a report to the Department of Commerce.

This furnace, which holds 40 tons of oil shale, is the first of 48 to be constructed. They are to be 3 feet in diameter and 50 in height, and will be arranged in 3 batteries of 16 furnaces each. After considerable experimentation, it was decided to adopt an internal heating system in preference to the Scotch system, and a method has been devised whereby the gas will be returned to the furnace and used more than once.

An initial appropriation of about $145,000 was made for the construction of the experimental furnace. The first oil was drawn off October 7 in the presence of some officials representing the Japanese navy. About a year ago a smaller experimental furnace of only 10 tons capacity was used. Oil from this small furnace was sent to the Japanese naval fuel depot at Tokuyama, where it was found that by mixing one part of the shale oil with two of crude Borneo oil a product of satisfactory quality for use on naval vessels was obtained. Distilling will be continued in the new 40-ton furnace for the purpose of determining if this furnace produces an oil of quality equal to that product in the 10-ton experimental furnace. Present indications are said to be that the results are satisfactory, and that it appears likely that the construction of the remaining furnaces will be commenced early this year.

The total cost of the forty-eight 40-ton furnaces will be between $2,000,000 and $2,500,000 or about $970,000 less than Scotch type furnaces of like capacity. In addition to producing shale oil, of which the anticipated annual production is placed at 25,000 tons, such by products as crude paraffin, sulphate of ammonia and coal tar are to be produced. The shale from which the oil is extracted is found in great quantities at the Fushun Collieries, and can be mined at slight expense, as it lies between the coal seam and the overburden. As the greater portion of the coal mined at the Fushun Collieries is taken from open cuts, heretofore it has been necessary to remove this oil shale together with the overburden before the coal could be reached. The successful exploitation of the shale oil project will, it is said, render Japan much less dependent on outside sources of heavy oil.

C.E.R.-T.S.R. Through Traffic Opened.—Through traffic on the Chinese Eastern and Trans-Siberian Railways has been resumed since May 15, according to a Harbin report. The service has been interrupted since the Great War.

Telephone Service between Peking and Dairen.—Connection between Peking and Dairen in Kwantung Leased Territory by Chinese and Japanese long-distance telephone services has already been established. The Dairen-Taonan line is also in operation.

Railways in Manchuria.—"There has been more railway expansion in Manchuria during recent years than in all the rest of China, and the consequent increase in prosperity of the Three Eastern Provinces is indicative of what might be effected elsewhere in China if the country were permitted to enjoy a period of peace," says Mr. R. L. Warren, Commissioner of Customs at Mukden in his report for 1926.

Dredging Operations in Hai Ho, Tientsin.—As a result of spring thaw on the upper reaches of the Yung Ting Ho, water carrying mud and silt is flowing from the Yung Ting Ho into the Hai Ho, in Chihli province, in unprecedented volume. This has caused an accumulation of much mud and silt in the Hai Ho at Tientsin, and is giving much inconvenience to navigation. It is estimated that 143,000 *fang* (each *fang* being about 100 cu. ft.) of mud are being poured into the Hai Ho daily. The four dredgers of the Hai Ho Conservancy Works are only capable of scooping out 2,400 *fang* a day. According to expert opinion, one of the fundamental solutions is the opening of a new course for the Yung Ting Ho leading direct to the sea.

Recent Improvements in Kwangsi.—(1) *Motor Roads.*—Motor road construction was started in Kwangsi province in 1922, the first public highway built being the Kweilin-Chuanchow Road. This was followed by the roads built by private organisations in Watlam district while other roads running from Liuchow to Nanning, from Liuchow to Kingyuan and from Nanning to Lungchow have either been constructed or are under construction. Traffic on all these roads is expected to be formally opened in August this year. For service on roads in Liuchow district alone 150 motor cars have been ordered. Funds appropriated for highway construction in the province last year amounted to $810,000 in round figures. (Cf. "Road-Building in Kwangsi Province," *Bulletin*, No. 297). In his Trade Report for 1926 (just published) Mr. H. B. Hawkins, Acting Commissioner of Customs at Nanning, Kwangsi, writes : "Road construction under trained direction was pushed forward energetically by the Kwangsi Department of Public Works in 1926. Nanning motor-cars are now driven miles across the hills into the country over roads solidly constructed according to modern technical requirements. The road improvements now in progress are designed, not only to develop the surrounding districts, but ultimately to connect distant parts of the province and to open up new outlets to river, sea, and frontier."

(2) *Wireless.*—The wireless station at Wuchow was the first of its kind built in Kwangsi province, and is capable of communicating within a radius of 1,500 miles. Larger and more powerful stations to reach 2,500 miles are being installed at Kweilin, Nanning, and Lungchow.

(3) *Tung Trees.*—Kwangsi province produces the largest quantity of wood oil obtained from *tung* trees in South China. All wood oil exported from Hongkong is Kwangsi product. In Liuchow district, 25,000,000 seedlings of this plant have been planted this year.

(4) *Mining.*—Kwangsi is especially rich in tin and manganese deposits, many of which are being worked with success. The minerals are marketed at Hongkong.

(5) *Mint.*—Kwangsi used to import coins from Hunan province. But a mint has been installed recently. It started operations from January this year, and is turning out $10,000 in 20-cent pieces daily.

Tokyo City Loan.—On March 21, the City of Tokio offered through a syndicate headed by J. P. Morgan & Co., $20,640,000 5½ per cent. bonds, unconditionally guaranteed by the Japanese Government as to principal, interest and sinking fund at 89½ and interest to yield about 6.25 per cent. The proceeds of the issue are to be used in completing the city's general reconstruction work, of which part was to be financed directly by Tokio and part by direct expenditure and advances by the Japanese Government.

Tokio, which owns and operates its street railways, water works and electric light and power system, has a population of over 4,000,000 people, being surpassed only by the metropolitan districts of London, New York and Berlin. Kuhn, Loeb & Co., National City Company, First National Bank, and the Yokohama Specie Bank, Ltd., are associated with the offering syndicate.

Ewo Cotton Mills, Ltd., in 1926.—A total net profit of Tls. 1,122,517.37 was realized by the Ewo Cotton Mills, Limited, proprietors of the Ewo Mills, Kung Yik Mills, and Yangtszepoo Mills, for the year 1926, according to the report and statement of accounts issued at the sixth ordinary meeting of shareholders held on March 15, 1927, by the general managers, Jardine, Matheson & Co., Ltd., No. 27, The Bund, Shanghai. A total of Tls. 203,430.15 was written off under items of buildings, plant and machinery, water supply, furniture, and motor car, a total of Tls. 175,000.00 transferred to special repairs and renewals fund, and a total of Tls. 50,000.00 added to equalization of dividends fund. An 8 per cent. dividend was declared on 9,000 preference shares, amounting to Tls. 72,000.00 and a dividend of Tls. 0.65 per share on 900,000 ordinary shares, amounting to Tls. 585,000.00. A total of Tls. 30,000.00 was appropriated as bonus to staff at mills, leaving a balance of Tls. 7,087.22 to be carried forward to the new account. The total authorized capitalization of the company is set at Tls. 6,000,000, of which Tls. 5,400,000 has been paid up; 900,000 ordinary shares at Tls 5.00 each and 9,000 8 per cent. cumulative preference shares at Tls. 100.00 each have been issued up to date.

Dockyard Relief Plans Approved.—Relief measures for the Kawasaki Dockyard Company received the tentative approval of the Cabinet Council.

According to the plan, the company's capitalization of Y.90,-000,000 is to be cut in half. It now is Y.69,750,000 paid up. It will declare no dividend for the time being.

According to the plan, the company has debts of Y.127,000,000, including debentures, bills payable and other items. The Government is to lend the company Y.30,000,000 in debentures of the Industrial Bank of Japan through the Deposits Bureau in the Finance Ministry. The Kawasaki company is to substitude preferred stock for Y.70,000,000 more of its debts. The remainder of Y.27,000,000 is to be raised by selling shipping, materials and real estate not needed at present.

Baron Goh called on Finance Minister Takahashi Tuesday night and discussed the problem with him. They agreed that the lending of Deposits Bureau funds will be a matter for the bureau's investment commission to decide. There was some opposition to this portion of the plan and the Government is known to be considering the issue of another Imperial ordinance, under which the Government would guarantee Bank of Japan loans to the Kawasaki Dockyard.

Another unsettled point is the re-action of the creditors to this plan. Until these two matters are cleared up final settlement will be impossible.

If these plans work out the vernacular papers expect that the Fifteenth Bank will announce its reopening on June 16. The emergency advances act has increased the bank's borrowing power. The proposed readjustment of Kawasaki Dockyard affairs would presumably add to the value of the securities held by the bank. It believes that it can raise Y.100,000,000 more from these sources.

Other plans, for readjusting all the other Matsukata enterprises, are said to be under way.

It is reported that Mr. Gen Nishino, president of the Fifteenth Bank, has decided to resign as soon as the bank reopens. The bank also is reported determined to sever its connection with the Kokusai Trust Company, selling its shares in the company. Withdrawal of deposits by this company was one of the principal reasons for the bank's closing.

Fares from Shanghai to Nanwei Increased.—On account of the high cost of living and the consequent increases in wages and cost of materials, the Shanghai-Nanwei Light Railway Co., Ltd., Chow Kia Doo, Pootung, decided on April 16, 1927 to increase its launch and light railway fares from Shanghai to Nanwei. The launch fare from Tung Kai Doo to Chow Kia Doo formerly 9 coppers, now is 10 coppers per passenger for per single trip. The light railway fare from Tung Kia Doo to Tang Li has been increased from $0.05 to $0.06 per passenger, that from Tung Kia Doo to Yang Szu Chiao increased from $0.08 to $0.09, that from Tung Kia Doo to San Lin Tang increased from $0.16 to $0.18, that from Tung Kia Doo to Tien Hua an increased from $0.20 to $0.23, that from Tung Kia Doo to Pai Ch'u increased from $0.24 to $0.28, and that from Tung Kia Doo to Chow Poo increased from $0.32 to $0.37.

Suzuki Campanies are Readjusting.—Readjustment is going on steadily among business companies under direct control of the Suzuki Shoten and those directly and indirectly affiliated. Out of 50 companies related more or less closely to the company, readjustment plans have been advanced already by nine companies, including the Tenma Textiles, Naniwa Warehousing, Sixty-Fifth Bank, Teikoku Steamship, Teikoku Rayon, Toyo Sugar Manufacturing, Nippon Flour, Godo Synthetic and Glycerine and Tairiku Lumber companies. Readjustment is to be completed on all these companies. These nine companies are regarded as the most hopeful business concerns of all the Suzuki enterprises.

Four companies, including the Kobe Steel Works, Teikoku Beer, Dai Nippon Salt and Teikoku Coal, will be the next to be readjusted.

Among other companies which are considered promising are the Nippon Commercial, Tokyo Woollen Textiles, Taisho Life Insurance, Shin-Nippon Marine Insurance, Nippon Educational Life Insurance, Honen Oil, Japan Camphor, Saisei Camphor, Toa Tobacco and Beisei Tobacco companies. But readjustment plans have been advanced by none of these companies.

Machine Shops in Tientsin.—The making of light machinery constitutes the main part of the work of the machine shops in Tientsin. These modernised works have come into existence in the last 20 years to meet the constant demands for repairs and additional parts in the semi-modernised flour and cotton mills in Chihli Province. They were mostly remodelled from those old style blacksmith shops of the early days which turned out cutlery, household utensils and agricultural implements of the most primitive type. The introduction of modern or semi-modern methods has enabled these workshops to manufacture such light machinery as weaving machines, cotton scutching machines, printing machines and water pumps. The number of such machine shops in Tientsin rapidly increased between 1918 and 1921 in response to a brisk demand for machinery by the semi-modernised industrial works in the province. As a side line, they also turn out iron kettles and skillets, hitherto secured from other provinces. During this boom period, over 200 shops were in operation, employing a total of thirty or forty thousand operatives. In view of their bright business prospects, they could obtain easy credit, and required little capital for a start. For instance, coal and pig iron were often supplied to them on credit. But during the past two or three years, the unsettled conditions in the country have greatly affected their business. The demands for their output have become sluggish, and credit facilities cannot be so easily obtained as formerly. As a result, some of the poorly financed works have been compelled to dispose of their accumulated stock at a great sacrifice or to suspend operations altogether.

Of two hundred odd works now operating in Tientsin, only about a dozen or so are well financed and can get along tolerably well. Instead of making industrial machinery, they now accept orders from the army for spades, iron skillets and other military equipment. Some of them also maintain a foundry department and a carpentry department for making machine parts. The monthly pay of a Tientsin operative varies from $9 or $10 to $17 or $18 according to individual skill, in addition to free lodging and board.

Besides these modernised works, there are between 30 and 40 old style blacksmith shops, each employing half a dozen hands. These shops are still engaged principally in making cutlery, household utensils and agricultural implements for the local market. A highly skilled hand of such a shop draws a monthly pay of $21 or $22 with free lodging and board.

Kiaochow-Tsinan Railway.—The following table is interesting as showing the yearly average of freight and passengers carried during the three stages of the Kiaochow-Tsinan Railway, *i.e.*, under German, Japanese and Chinese management. The actual figures for 1926 are 1.7 million tons freight and 3.4 million passengers.

		Freight	*Passengers*
1905-12	German	575,000	844,000
1915-22	Japanese	1,444,000	2,341,000
1923-26	Chinese	2,029,000	3,767,000

Shanghai Electric Construction Co., Ltd.—A dividend of 10 per cent. for 1926 was declared by the Shanghai Electric Construction Co., Ltd., 7-8 Soochow Road, Shanghai. The traffic receipts for the year had increased by £50,500 as compared with 1924, and the operating expenses were £39,476 higher, leaving a net improvement of £11,024 in the operating profit, according to its annual report for 1926. The balance for appropriation was £17,631 higher than in 1924. The increase in operating expenses was due to higher prices for supplies and a definite increase in the wages paid to the operating staff.

Kirin-Hailung Railway.—The construction of the Kirin-Hailung Railway in Manchuria was formally started on June 25. The whole line is expected to be completed in the summer of 1929. The railway, covering a total length of about 40 *li*, will have 13 stations, each at an interval of about 30 *li*. The line will terminate at Chaoyangchen . The section between Chaoyangchen and Hailung, about 70 or 80 *li* apart, will be constructed by the Mukden-Hailung Railway Administration. As the line traverses a country which at present is in an economically backward state, five commercial ports will be opened for trade development. These include Hwangchitun, Shwanghochen, Yentungshanchen, Panshih and Chaoyangchen. Among these Chaoyangchen and Yentungshanchen are of greater commercial possibilities than the others. As the present town of Chaoyangchen is situated on a low plain and subject to periodical inundations, a new commercial quarter will be built on a more elevated site, above five *li* east of the present town.

Motor Vehicles in Fukien.—The rapidly increasing number of motor vehicles in use in the inland districts accounts for the higher shipments of gasolene.—*Amoy Customs Report, 1926.*

G.I.P. Main Line Electrification.—A short time ago the High Commissioner for India placed with the British Thomson-Houston Co., Ltd. the order for the complete sub-station and Track Sectioning Equipment for the Electrification of the Main Lines of the Indian State Railways from Bombay to Igatpuri and from Bombay to Poona, which is being carried out to the plans of Messrs. Mers and McLellan.

The alternating current supply is at 95,000 volts, three phase, 50 cycles, and at the substations it is converted to 1,500 volt direct current, by means of step down Transformers and Rotary Converters, each Rotary Converter unit comprising two machines in series.

There will be 7 Double Unit sub-stations and 4 Triple Unit sub-stations, so the total number of Rotary Converters will be 52, having a rated output of 1,250 k.w. each. The total output installed will therefore be 65,000 k.w.

The system of operation differs from the fully automatic equipment supplied by The British Thomson-Houston Co., Ltd. for the Natal Electrification of the South African Railways, in that approximately half of the sub-stations will be semi-automatic, and from these the remainder will be controlled by supervisory control apparatus. The Track Sectioning Cabins will be automatic giving back indication by means of supervisory control apparatus to the attended sub-stations.

The execution of this order will provide a considerable amount of employment at home since The British Thomson-Houston Co., Ltd. are manufacturing at their own Works at Rugby and Willesden the Rotary Converters, Control Gear, 95,000 volt switchgear and Lightning Arresters, and 1,500 volt switchgear, while the subcontractors to The British Thomson-Houston Co., Ltd. for the Transformers are The British Electric Transformer Co., Ltd. and for the Supervisory Control Equipment, Messrs. The Standard Telephones & Cables Ltd.

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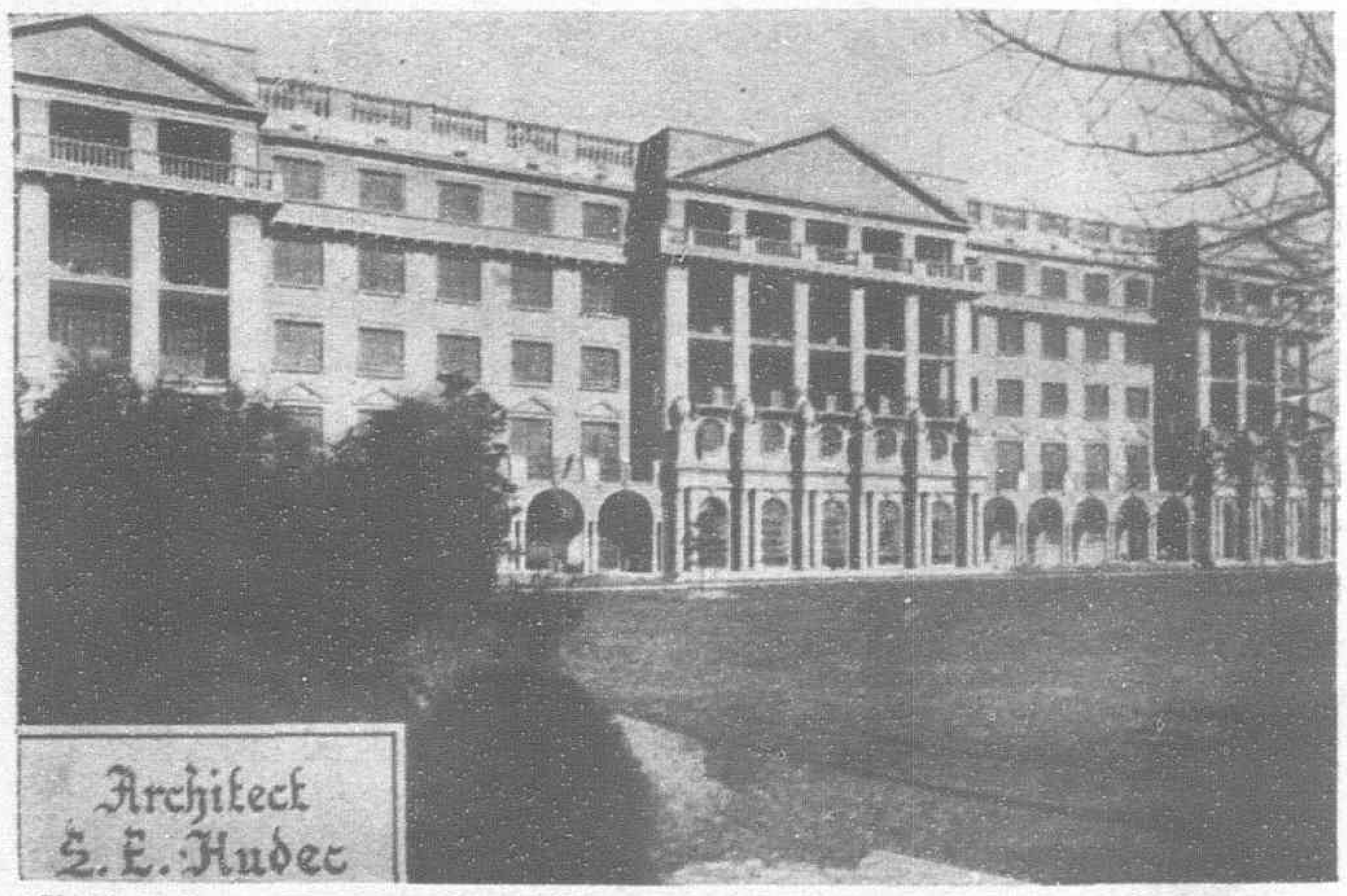

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